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DECEMBER 15, 1959
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TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

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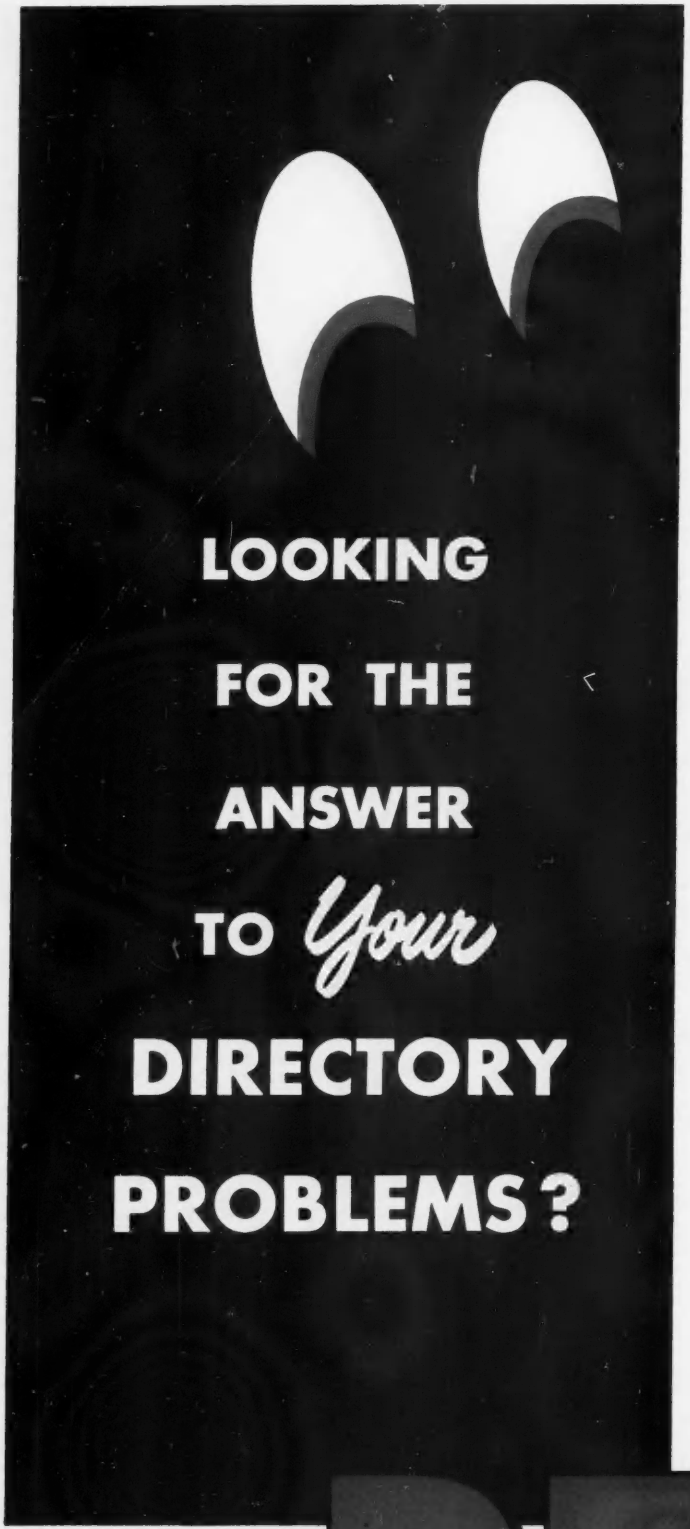

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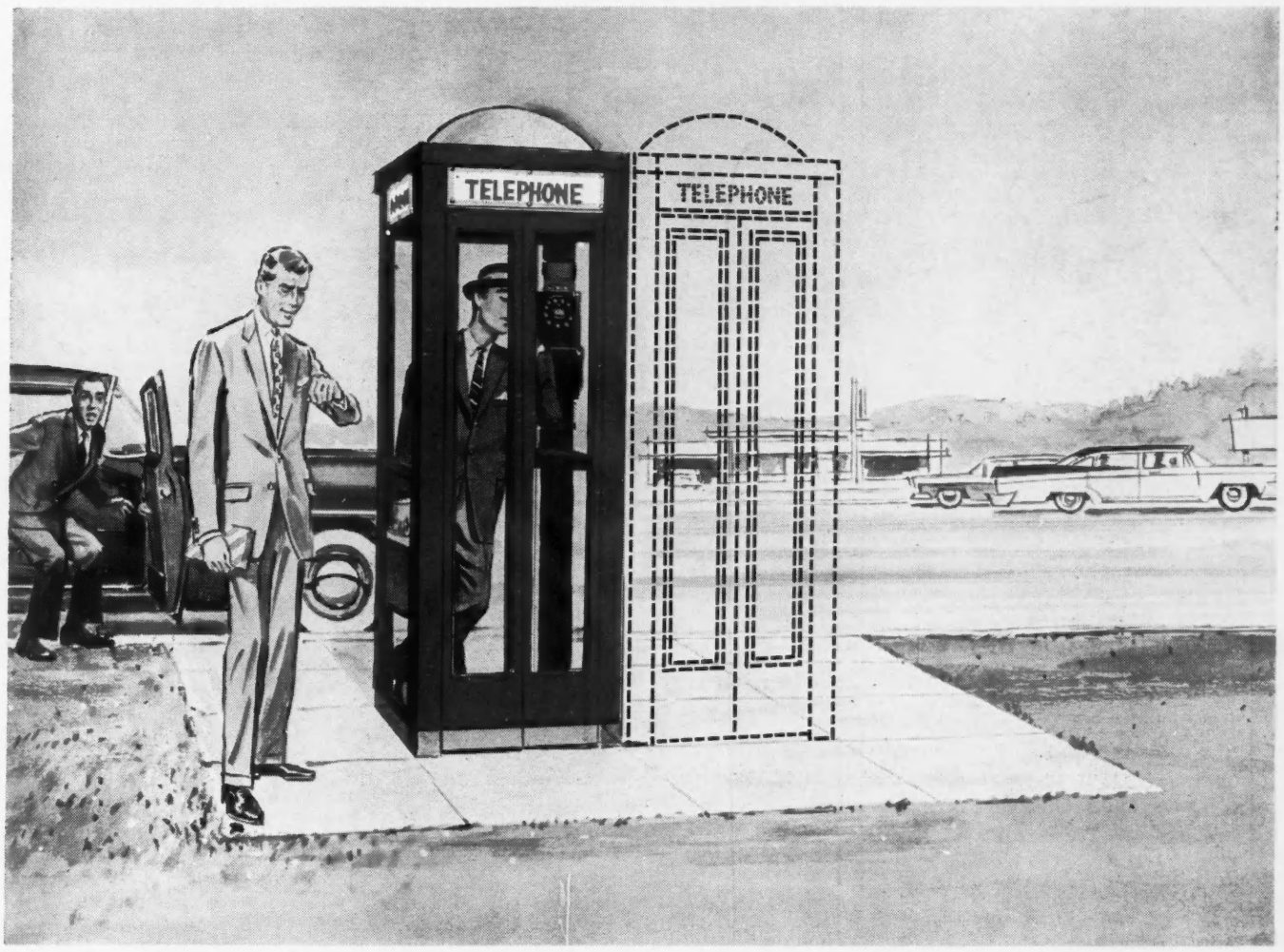

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EDITORIAL STAFF

ROY F. SMITH
Publisher

JOHN G. REYNOLDS
Editor

DICK REYNOLDS
Production Mgr.

JANE KELLEY
Editorial Assistant

JOHN S. REED
Technical Editor

ROLAND DAVIES &
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Washington Editors

Contributing Editors
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C. D. EHINGER
L. A. GRITTEN
G. M. JONES
D. A. PERIGO
LEO SANDS
ALLAN R. STACEY

ADVERTISING SALES STAFF

DONALD C. SORENSEN
Advertising Manager

BETSY MEYERS
Advertising Assistant

KEITH H. EVANS
& ASSOCIATES
3723 Wilshire Blvd.
Los Angeles 5, Calif.
Tel. — DUnkirk 8-2981

515 Market St., Rm. 225,
San Francisco 5, Calif.
Tel. — YUkon 2-4280

BUSINESS STAFF

ROY F. SMITH
President

DONALD C. SORENSEN
Executive Vice President

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TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

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The TE&M Front Cover

Jo Schmidt (left) and Millie Engelstad, both of Pacific Bell's Seattle, Wash. commercial, share the spotlight with "Sellmor the Space Man," and a colorful display used for Seattle's four-month Yellow Pages sales campaign. Slogan: "Win the Race into Space." The display was made by John Holmes, Yellow Pages salesman. Photo by Merle Jordan — Courtesy of "PTM" (Pacific Tel. Magazine).

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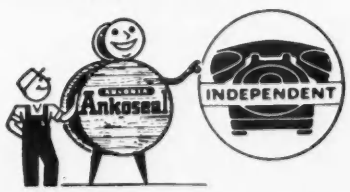

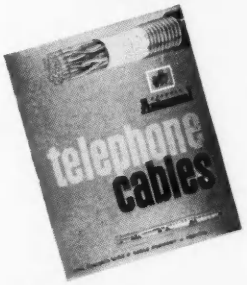

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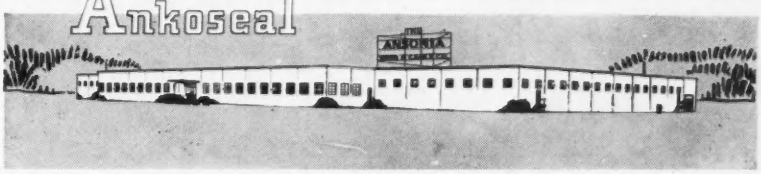

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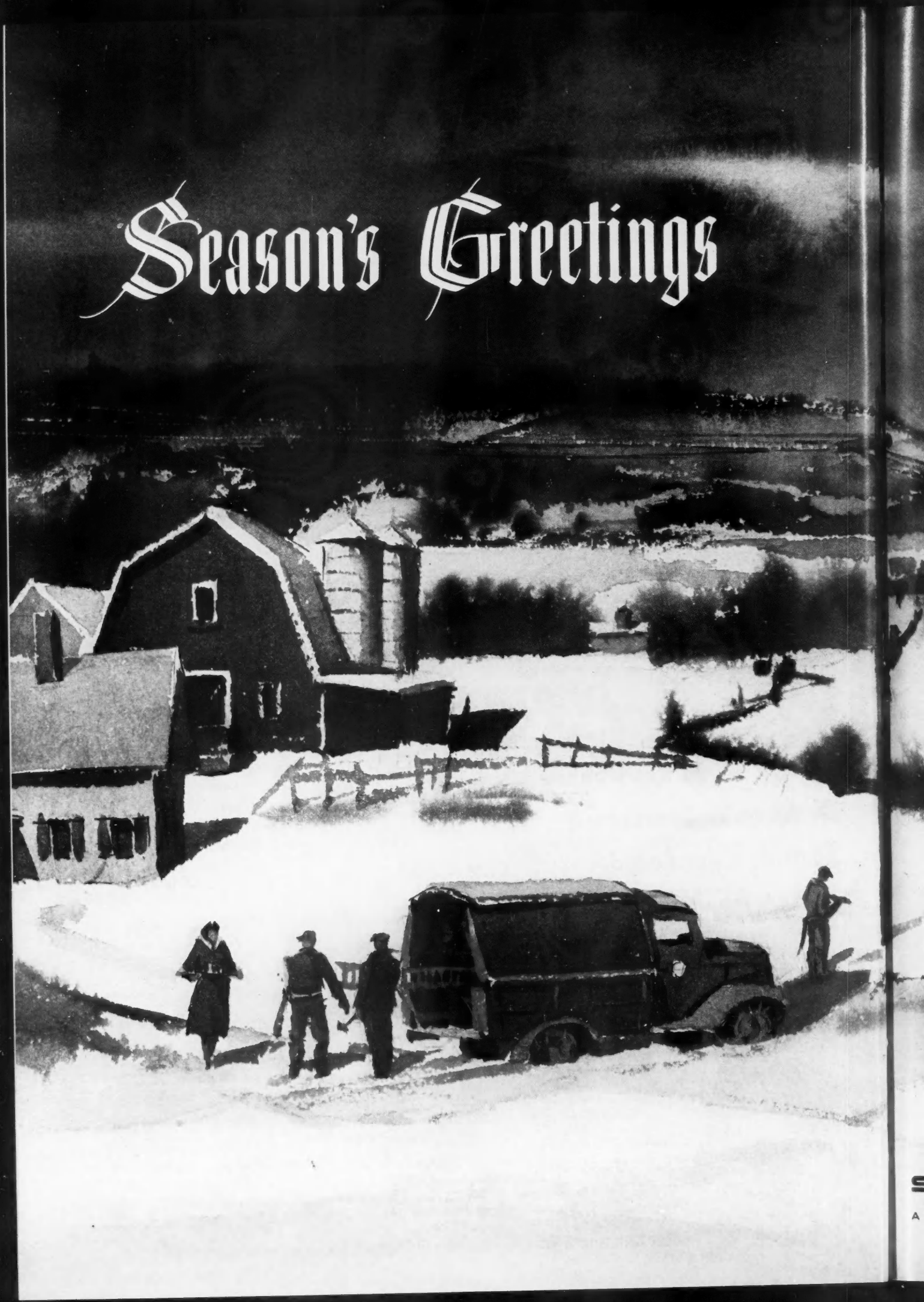
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LOUISIANA Tel. Assoc., Jung Hotel, New Orleans, La., Feb. 24-25, 1960.

KENTUCKY Tel. Assoc., Phoenix Hotel, Lexington, Ky., March 1, 1960.

TEXAS Tel. Assoc., Baker Hotel, Dallas, Texas, March 7-8, 1960.

OHIO Tel. Assoc., Deshler Hilton Hotel, Columbus, Ohio, March 28-30, 1960.

IOWA Tel. Assoc., Ft. Des Moines Hotel, Des Moines, Iowa, April 5-6, 1960.

NEBRASKA Tel. Assoc., Hotel Not Announced. Omaha, Nebraska, April 19-20, 1960.

INDIANA Tel. Assoc., Claypool Hotel, Indianapolis, Indiana, May 4-5, 1960.

ILLINOIS Tel. Assoc., Abraham Lincoln Hotel, Springfield, Ill., May 19-20, 1960.

KANSAS-MISSOURI Tel. Associations, Town House, Kansas City, Kans., May 23-24, 1960.

PENNSYLVANIA Tel. Assoc., Bedford Springs Hotel, Bedford Springs, Pa., June 6-7, 1960.

CALIFORNIA Tel. Assoc., Fairmont Hotel, San Francisco, Calif., June 8-10, 1960.

WASHINGTON-OREGON Tel. Assoc., Sheraton Portland Hotel, Portland, Ore., June 16-17, 1960.

NEW YORK Tel. Assoc., Scaroon Manor, Schroon Lake, N. Y., June 20-22, 1960.

NATIONAL CONVENTION, Conrad Hilton Hotel, Chicago, Ill., Oct 9-12, 1960.

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Extra long receiver KOILED KORDS in color enable you to offer another service to those subscribers who want to move more than four and a half feet from their instruments.

New, long KOILED KORDS retractile cords in color — and in black — are offered in two standard lengths, 18 inches retracted that extend to approximately 9 feet and 30 inches retracted that extend to 15 feet.

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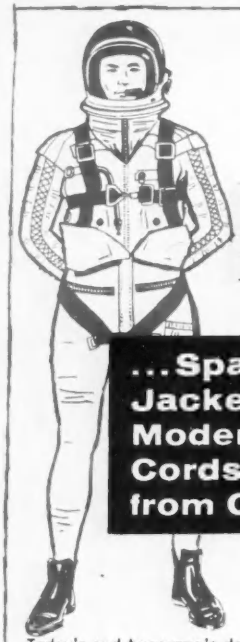

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Superior to Neoprene in toughness and crack resistance, this P.V.C. (Poly-Vinyl-Chloride) jacketing has other advantages, too. Jacket's smoother inner surface permits conductors to flex freely . . . eliminates binding and fracturing —thus assuring longer noise-free life.

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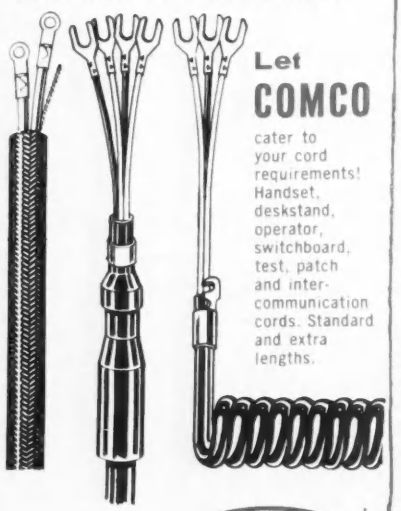

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INDUSTRY NEWSLETTER

Commission OK's So. Bell Railroad Connection Tariff

Tariff filed by **Southern Bell Tel. & Tel. Co.,** covering interconnection of railroads' private communications systems with facilities of Southern Bell under certain circumstances, & similar to **American Tel. & Tel. Co.** tariff on which FCC hearings have been held, has been approved by **South Carolina Public Service Commission.**

Commission noted that tariff gives "interconnection privileges to right-of-way companies that are not offered to other subscribers. Because of the fact that these companies do have special communications needs along their rights-of-way, the commission finds that those privileges and the terms and conditions of these tariffs are reasonable, but takes this occasion to reaffirm its position that facilities used in providing a regulated telephone service to the general public should not generally be connected to communications facilities not themselves subject to regulation."

South Carolina commission decision is 1st reported as result of series of cases in which some railroads have protested Bell System companies' intrastate tariff filings. Southern Railway System appeared as a protestant before South Carolina commission.

* * *

NTCA Reports on Rural Co-op Survey

Majority of telephone cooperatives, surveyed by **National Telephone Cooperative Association** on their future outlook if present 2% interest rate on Rural Electrification Administration loans is raised, said they no longer would be able to provide service at rates "competitive" with those of nearby telephone companies, association reported. Assuming no change in interest rates, about half of co-ops do not plan to raise their rates by 1970, NTCA said. Conversely, indicating "'high costs of operation," none of reporting co-ops said they plan to reduce rates by 1970.

* * *

Mumford Named Engineer-In-Chief Of British Post Office

Albert H. Mumford, O.B.E., deputy engineer-in-chief of **British Post Office,** will become engineer-in-chief effective Feb. 1, 1960.

Mumford will succeed **Brig. Sir Lionel H. Harris,** K.B.E., T.D., engineer-in-chief since 1954, who is retiring Jan. 31. Also announced were appointments of **Capt. Charles F. Booth,** C.B.E., and **D. A. Barron,** who have been serving as assistants engineer-in-chief, to posts of deputies engineer-in-chief.

Mumford joined British Post Office in 1924, & was named assistant engineer-in-chief in 1951. He was member of United Kingdom delegation to Atlantic City radio conference in 1947.

* * *

New Device Produces High Voltage Electricity

International Tel. & Tel. Corp. announced development of device, expected to have far-reaching effects in space communications & space travel, which can produce high-voltage electricity directly from warming power of a sunbeam or other heat source.

Called a ferroelectric converter, device supplies both AC & DC current at

high voltages, unlike solar batteries which supply only direct current at low voltages. ITT development also can rely on other than solar light for its energy.

ITT said converter could be used to power transmitters, receivers & similar equipment in space vehicles. It appears that extremely high voltages can be obtained to provide power for propelling space ships, ITT scientists said.

Using single converter element, size of dime, outputs of more than 1000 volts have been obtained directly without need for voltage step-up devices. By arranging elements in series, outputs of 1,000,000 volts are theoretically possible, it was pointed out.

* * *

Earnings Of General Of Florida Continue Upward Trend

Third quarter report of **General Telephone Co. of Florida** shows "continuation of upward trend" started early this year, President **Carl D. Brorein** pointed out in statement mailed to stockholders. For 1st nine months of this year, earnings per common share equalled $2.20, compared with $1.71 for same period of 1958. Net income for 9-month period was $3,524,220 in 1959 & $2,609,802 in 1958. During 1st nine months of this year, company had net increase of 18,630 stations.

* * *

New Tap-Proof Cable

Cable which is described as providing "absolute protection against tapping by direct contact or induction" is being produced by **Mosler Research Products, Inc.,** affiliate of **Mosler Safe Co.** Companies using cable in internal communications networks are protected against wiretapping or eavesdropping, recent report stated.

Mosler said cable is covered by successive layers of foil sheathed in plastic, connected to highly sensitive relay apparatus which responds to changes in electrical current as low as two one-millionths of ampere. Attempts to tap wire activate relay, causing alarm to sound at control point, while added protection against inductive tapping is provided by noise generator which transmits signal many times greater than amplitude of conversation carried in cable.

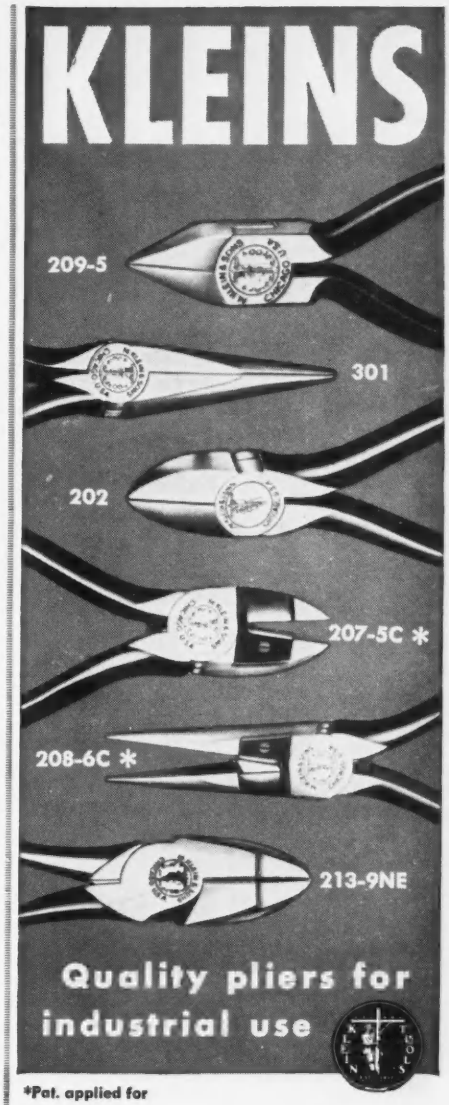
* * *

Industry Highlights

United Utilities, Inc., had consolidated net income in first nine months of 1959 of $3,499,590, compared with $2,698,012 for same period of 1958, it was reported last month. Earnings per share for nine-month period in 1959 were $1.528; in 1958 they were $1.217 . . . On his own motion, FCC Examiner **Jay A. Kyle** has continued without date scheduled FCC hearing on tariffs for data transmission channels filed by **West Coast Tel. Co.** Hearing had been scheduled to start Wednesday, Dec. 30.

Net income of **Rochester (N.Y.) Tel. Corp.** for first nine months of year was $1.14 a share, compared with 99 cents a share on fewer shares outstanding last year, President **W. A. Kern** reported last month to stockholders. Kern said telephone gain for January-September period was 7478, against 6072 in same months of 1958. It was also reported that **H. Elwood White,** controller of Rochester Telephone, who has been with company for 37 years, has been elected a vice pres.

Public interest certification for its proposed acquisition of **Butler County Tel. Co.,** which provides common battery service to about 130 customers in area about 10 miles east of Poplar Bluff, Mo., from headquarters at Fisk, Mo., was asked of FCC last month by **Southwestern Bell Tel. Co.** Proposed purchase price is $12,000 . . . **British Columbia Tel. Co.** earned $2.27 per share for nine-month period ended Sept. 30, compared with $1.26 for same period of 1958, year in which company failed to earn dividends in



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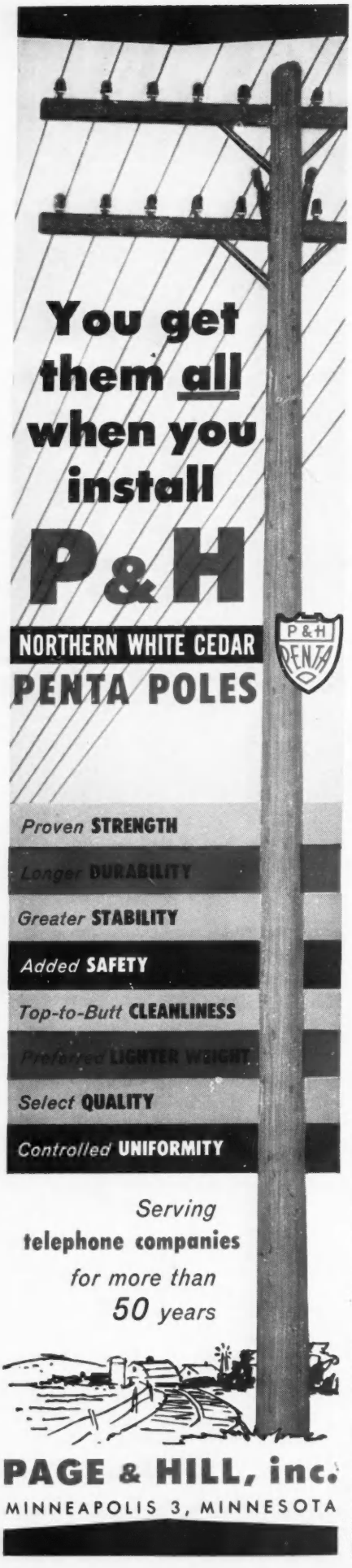

INDUSTRY NEWSLETTER

(Concluded from page 9)

full, Pres. **C. H. McLean** reported last month. Net income for nine-month period totaled $4,981,053, compared with $3,091,264 for same period of last year. Operating revenues amounted to $40,528,427, compared with $32,873,015 a year earlier.

Halstad (Minn.) Tel. Co. & **Farmers Mutual Tel. Co.,** Lynden, Wash., asked FCC for construction authority to establish new two-way common carrier mobile radiotelephone systems in their areas. . . . Included in list of 73 people named to serve on National Defense Executive Reserve of Business & Defense Services Administration are: **Edward D. Hennigan** of **Teletype Corp., George A. Gehr** of **General Tel. Co. of Northwest, Paul R. Parsons** of **Rhinelander (Wis.) Tel. Co.**

Boyd M. Wedgwood has been appointed military communications supervisor of **Lincoln (Neb.) Tel. & Tel. Co.** Wedgwood joined company in 1937 as groundman; later was combinationman & PBX installer before becoming commercial representative in 1955. He was appointed service engineer later that year. . . . **James E. Dingman** has been elected vice pres. of **American Tel. & Tel. Co.** & appointed chief engineer to succeed **Harold R. Huntley,** who retires at end of year after more than 42 years of Bell System service. Dingham has been director of operations of A. T. & T.'s Long Lines Department for last three years. He will be succeeded in that post by **C. Earl Schooley,** vice pres. in charge of operations of **Indiana Bell Tel. Co.** Dingman began Bell System career in 1921.

Leonard Bessman named member of **Wisconsin Public Service Commission.** He succeeds **George P. Steinmetz,** who returned to former post as chief PSC engineer . . . **Illinois Bell Tel. Co.** announced series of transfers & promotions as part of administrative reorganization for its area outside Chicago. **Gordon Aller,** general manager of Illinois Bell operations outside Chicago, becomes general manager of newly created suburban operations area. **Robert P. Reuss,** assistant comptroller, **American Tel. & Tel. Co.,** will serve as general manager of remaining state area. Other appointments include: **Warren W. Schmalenberger** to asst. general manager of new state operation outside metropolitan Chicago; **Granville P. Brosman** to chief engineer in new state area operation; **Jack B. Gable** to general plant manager of new state area operation; **Clyde W. Byers** to general commercial manager for new state area; **John T. Trutter** to general traffic manager for new state area; **William R. Tatman** to general plant manager for new suburban area.

Walter A. Giles named vice pres.-marketing of **New York Tel. Co.** He will be succeeded as vice president of company's Long Island Area by **Robert M. Burke,** now gen. mgr. of Northern Area, with headquarters at Utica. . . . Appointment to Civil Aeronautics Board of **Alan S. Boyd** has been announced by White House. Boyd was chairman of **Florida Railroad & Public Utilities Commission.**

* * *

Mrs. Ray Manson Dies

Mrs. Ray H. Manson, 81, wife of former pres. & board chairman of **Stromberg-Carlson,** died at Rochester, N. Y. She leaves her husband; a son, **Stanley H. Manson;** and a daughter, **Mrs. John R. Williams,** all of Rochester, N. Y.

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research and development in antenna systems and components are coming from the Industry's newest, most complete facility

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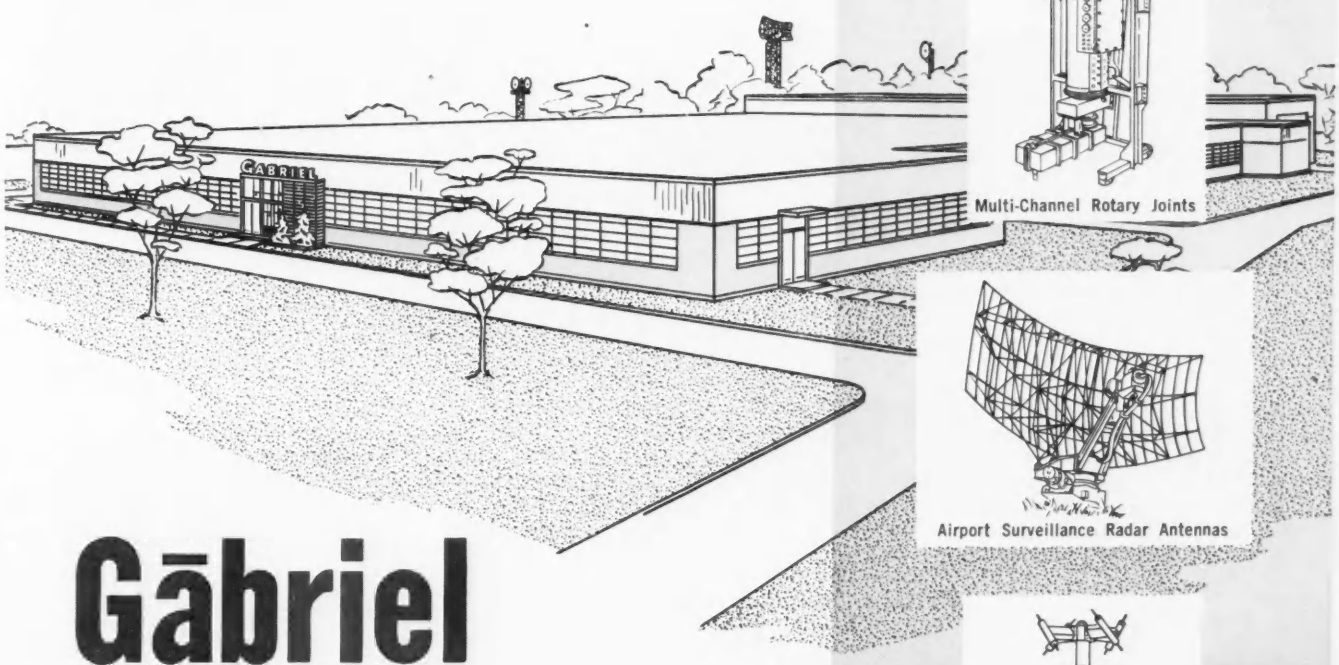
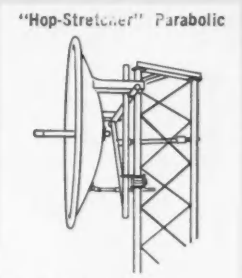


Gābriel

Electronics Division, Gābriel Company, announces the opening of a new 75,000 square foot facility in Millis, Massachusetts devoted to research, design, manufacture and testing in the field of microwave antenna systems and components. Here, experienced capabilities — plus one of the most comprehensive Facilities of modern American industry — are combined to produce dramatic new "Advances in Antennas".



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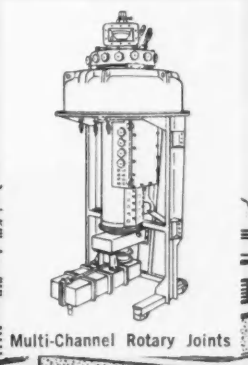
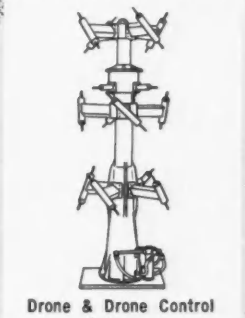
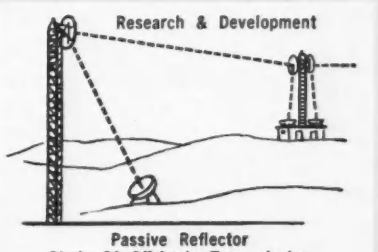


Multi-Channel Rotary Joints

Airport Surveillance Radar Antennas



Drone & Drone Control Antennas



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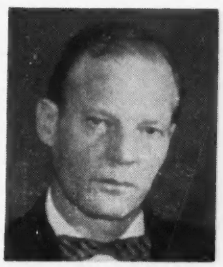
R. M. Millner–Champlin, Minn.

H. E. Solem–Tallahassee, Fla.

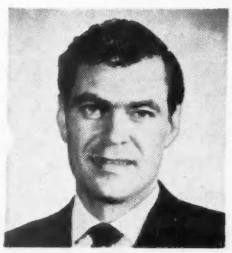
J. A. Dolsen—Detroit

D. F. Snyder—Denver



J. Fordham–San Francisco

W. J. Wiseman–Los Angeles



Alan Urschel—Dallas

Ray Willard—Dallas

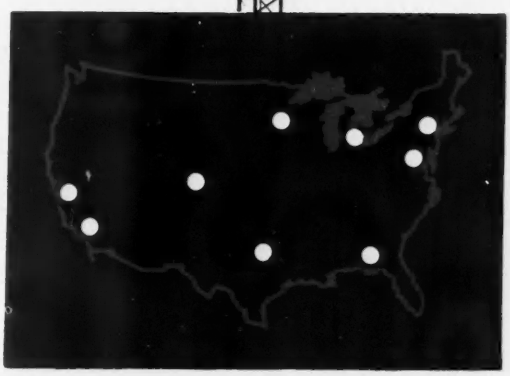
Carl Service—Dallas

Bob Hancock–Washington, D.C.

Kerry Fox—Dallas

Burke Farquhar—New York City

COLLINS
MICROWAVE AND CARRIER



This chorus usually sings the praises of Collins Microwave and Carrier Equipment. They are the 13 sales engineers who represent Collins' Texas Division to utilities, railroads, telephone and pipeline companies. During this holiday season, they extend Christmas greetings from the 1,750 employees of Collins' Texas Division to Collins' friends everywhere.

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LETTERS

"We'll Miss You!"

TO THE EDITOR: — "At hand is a notice that my subscription to *Telephone Engineer & Management* is about to expire. It is my intention to let it do so. Your magazine is splendid. It has been interesting, informative and helpful to me for many years.

However, it no longer serves my purpose now that I am retired. Leisure-time activities not associated with the telephone industry naturally have come along to replace my former telephone endeavors. *Telephone Engineer & Management* quite properly is directed toward people active in the industry, not to retirees, and you will understand why it has become less interesting to me than formerly. A check of your records will disclose that my subscription extended over a period of 45 years. That's long enough anyway, don't you agree?

"Please let me wish you every success. May your magazine continue to be as outstanding in the future as it has been during the years in which I have taken it."

Edgar A. Fuller,
213 Fourteenth St.,
Santa Monica, Calif.

* * *

"Carrier Maintenance"

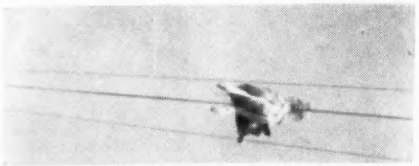
TO THE EDITOR: — "I have read the article on 'Carrier Maintenance and Test Gear' that was published in your October 15, 1959 *Telephone Engineer & Management*. This article was very interesting and informative. Would it be possible for me to receive about 15 reprints of this to circulate amongst our maintenance personnel?"

P. P. Ash,
Superintendent,
Communications & Signals,
Louisville & Nashville Railroad Co.,
Louisville 1, Ky.

Sorry reprints are not available. Will 15 sets of tear sheets help? Let us know and we will send them along.

"We Agree!"

TO THE EDITOR: — "I am sending you an unusual Kodak picture



that I took of this dead rabbit across my telephone lines east of Benedict, Kans. the month of June, 1959. The dead rabbit across my lines shorted out the entire line. I would like to call this a troubleshooter nightmare."

Jennings B. Thornton,
Russell, Kans.

* * *

"Glad To Help"

TO THE EDITOR: — "We are interested in obtaining a list of handbooks and other training material for use in a telecommunications training program in Southeast Asia. Please send us a list of all such material available from *Telephone Engineer & Management*."

S. Peter Welgos,
Lakeland, Michigan City, Ind.

* * *

"Glad We Could Help"

TO THE EDITOR: — "The total print order for the September-October issue of *The Transmitter* was 41,500. This was the issue in which Mr. Kappel's article from your July 15 issue was reprinted. I am sending you the four copies of this issue."

Carl H. Claudy, Jr.,
Chesapeake and Potomac Tel. Co's.,
Washington 5, D. C.

"Letters From Readers" has been created to serve as a clearing house for ideas, comments and suggestions that will be helpful to all members of the telephone industry. Address "Letters," care of TE&M, 7720 Sheridan Rd., Chicago 26, Ill.

LARK IS "HAPPY TALK" FOR A BIG TELEPHONE COMPANY

21.2 miles per gallon of gasoline is only a part of the fine record for savings With 10,000 miles now on each of their Larks, the Motor Vehicle Superintendent of this Telephone and Telegraph company reports: "Oil consumption is negligible. No repairs, no parts purchased as yet." Larks are in demand from his car pool—"Drivers like their ease of handling in traffic." While we cannot name this company, the actual testimonial is in our files at South Bend—with many others.

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Despite satellites, the workhorse of systems communications will still be the same old cable pairs. But with alternate routing and VNL you'll regard them in a new light; and you'll take a more searching look at load coil spacings, net loss and return loss, while bias and sigma (old words with new meanings) will force you to correct trunks that don't meet minimum standards.

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AIRTRONICS Artificial Lines can be a vital tool in your technical training program for plant and engineering people. In them are combined all the essential elements for use in demonstration lectures, in laboratory classes — or both.

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AIRTRONICS standard Artificial Lines accurately simulate a loaded or non-loaded cable pair of any desired length — from 600 to 39,600 feet.* Push-button switching affords instant control over total length or load section lengths, so that coil spacings may be set to better than 1%, or as much as 10%. Common irregularities such as bridged taps, mixed loading or coils omitted can be introduced in a moment.

**Available with plug-in units for either #22 or #24 gauge cable, or mixed 22 and 24 gauge. Other commonly used gauges available on special order.*

For more detailed technical specifications, just ask us to rush you AIRTRONICS Artificial Line Brochure #1.021A. It will include equipment arrangements for a number of demonstration set-ups clearly showing the effect of equalizers, loading systems, reflections, singing points, and other characteristics.

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the new way to install service drops and splicing cases. Protective armor increases diameter of messenger to accommodate D Span Clamps or splice case attachments.

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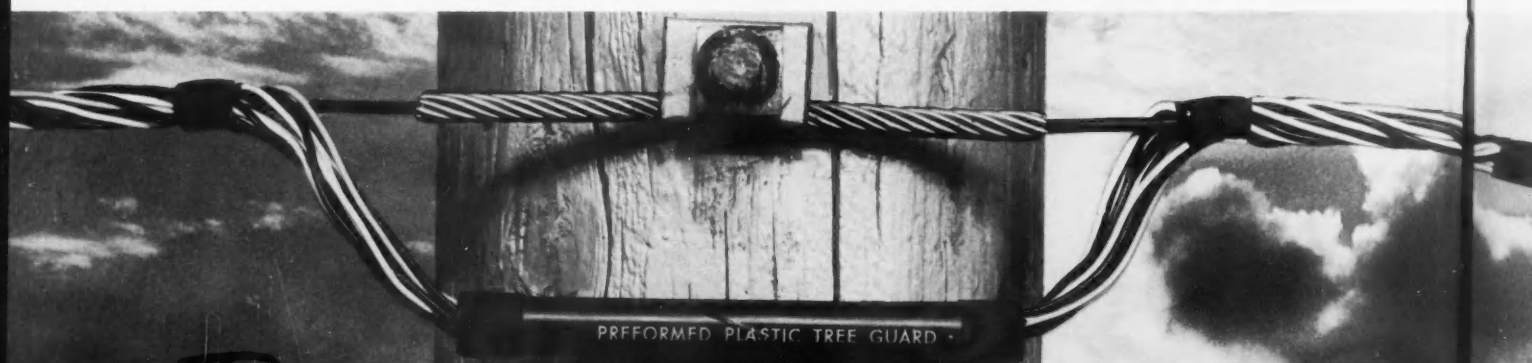

Use *Preformed*™ ALUMINUM ALLOY ARMOR RODS

with one-bolt clamp to avoid expensive J-Hook installations. Armor Rods protect insulated messenger from clamping stresses and increase holding power.

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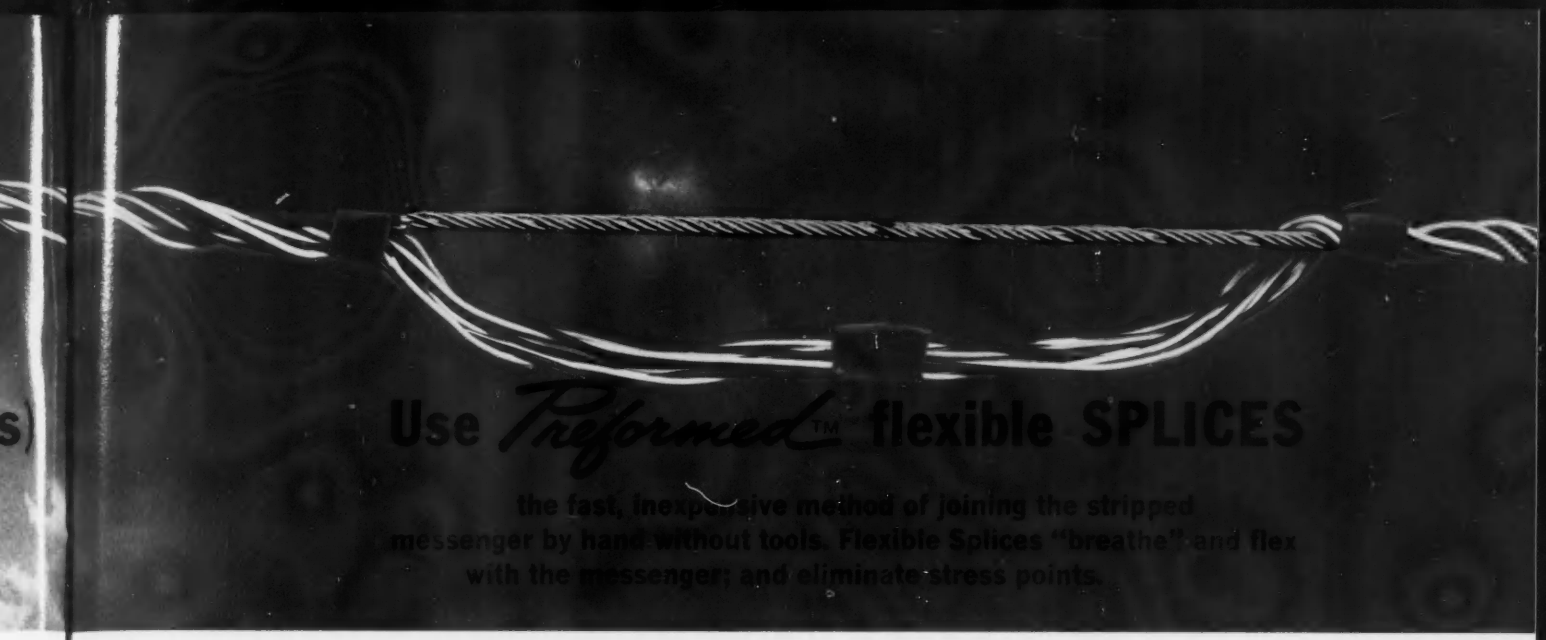

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the fast, inexpensive method of joining the stripped messenger by hand without tools. Flexible Splices "breathe" and flex with the messenger; and eliminate stress points.

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Distribution Wire

Use *Preformed*™ DEAD-ENDS

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Patented — U.S. Patent Numbers 2,761,273; 2,609,653; patents pending

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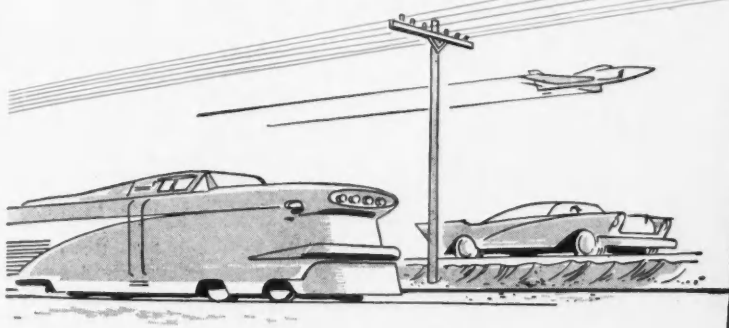
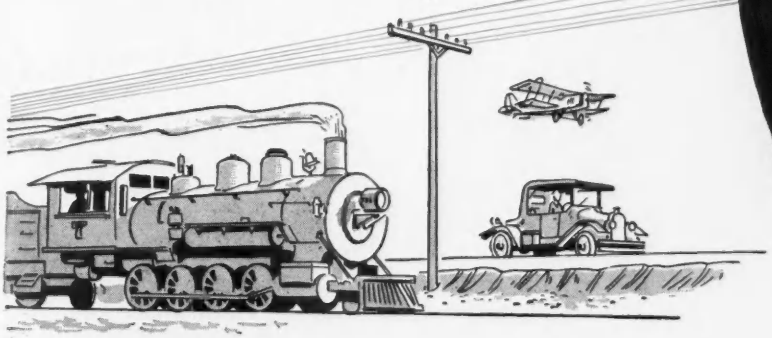
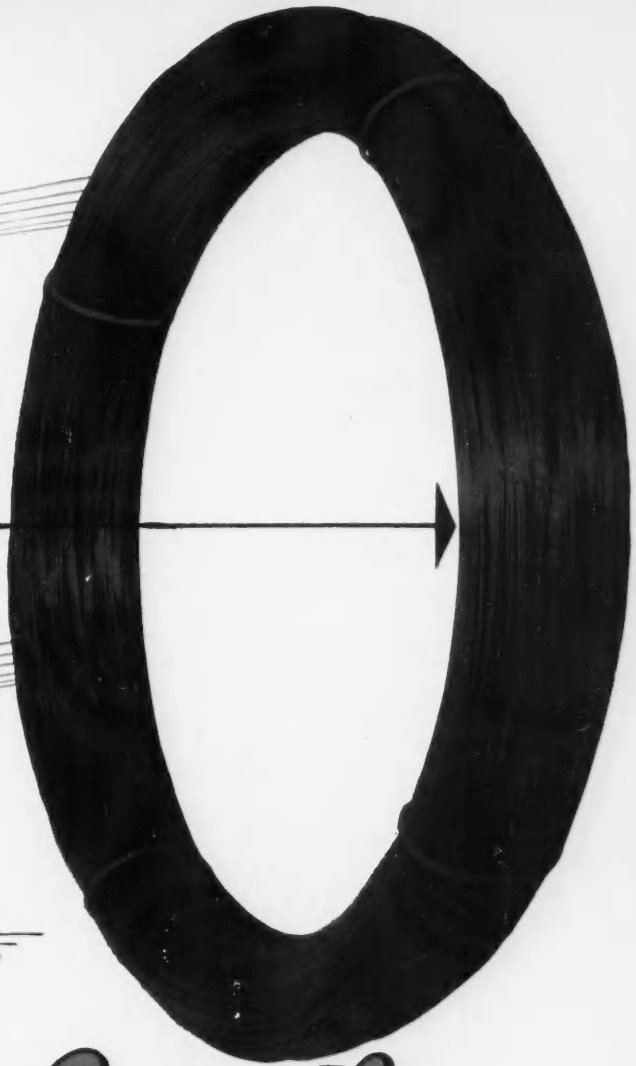


as the day it was installed





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Here's a line wire that refuses to grow old! Copperweld* Lines strung decades ago are still giving top performance. This long service life is possible because Copperweld has an ageless copper covering to prevent corrosion. And the rugged steel core, protected by the copper, assures permanence even under the most severe weather conditions, and provides strength for long-span construction.

Not only proved in past performance, but designed to stay modern for the future, Copperweld Line Wire is the best engineered conductor for voice, carrier and signal circuits. Write today for your copy of the Copperweld Engineering Data Book.

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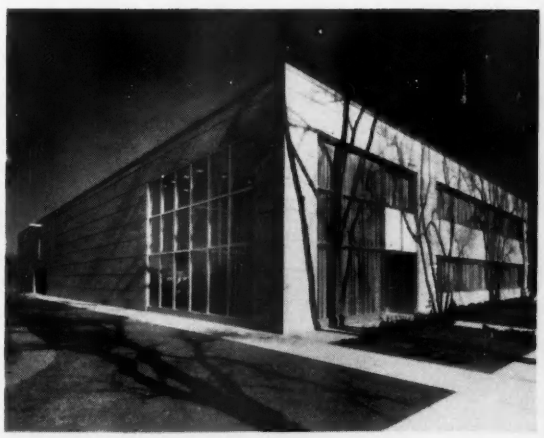
Help You

Let's face it. If you want to stay ahead in business, you have to have some creative genius orbiting in the back room.

Seriously, Leich has always spent considerable time and money on research to bring the telephone industry advanced equipment, better ways to get the job done.

You help us carry on valuable research and development work when you purchase supplies from Leich. Besides, we give you the finest supply service available. You get fast delivery along with the highest quality tools, supplies and materials.

Why not order your supplies where the whole company is working for the long haul and not the quick dollar? Try us for your next supply order. You'll like Leich.



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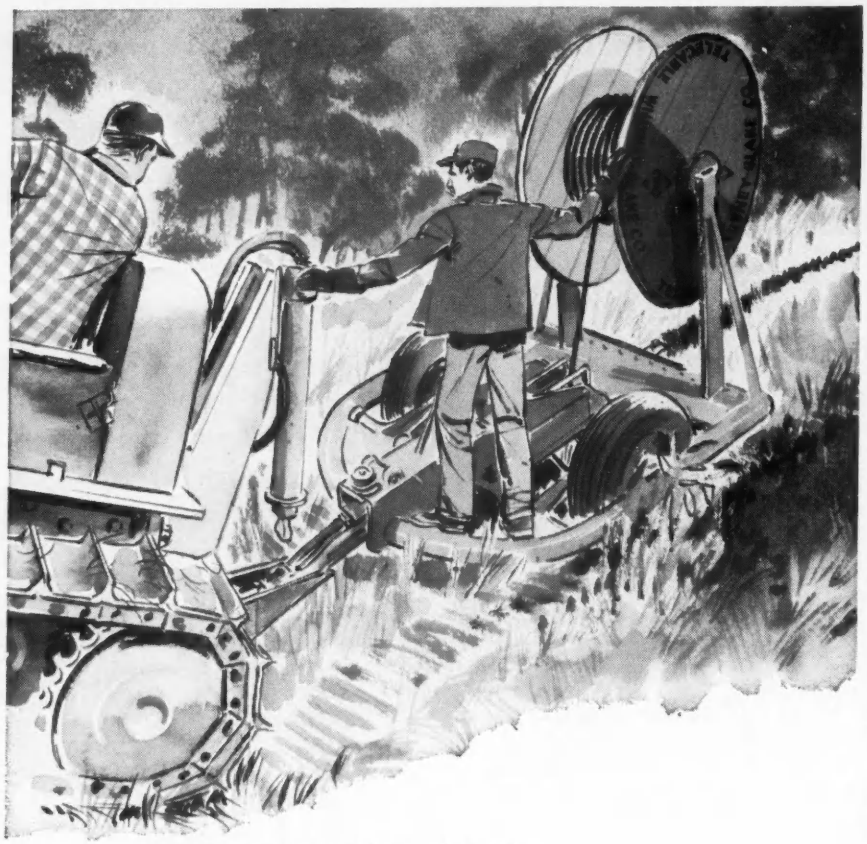

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It is quality that makes for true economy . . . that's why we can say "bury it and forget it."

WB TELECABLE — Type DB
Complies with REA
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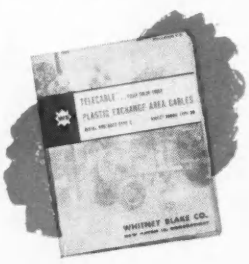

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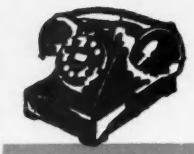

INDUST

We Must Ride The Wave

NEWSPAPER publicity regarding the Post Office experiments with facsimile transmission has not been kind to us. John Public is left with an impression of "dog in the manger" delaying action by the utilities. We learn that Post Office officials are working on the development of a facsimile service that will effect coast-to-coast delivery of letters in a few minutes, at a cost ultimately to be even less than the present airmail rates. Then we are told that the White House, in response to private utility protests, has urged Postmaster General Summerfield to "go slow" and avoid injury to the utilities.

Facsimile letter service is coming. No doubt it will hurt our long distance and telegraph service. If we fail to participate in it, we shall suffer; and we may expect as much sympathy as the owners of sailing vessels received when steamships pushed them off the seven seas. If we do not ride the wave, so much the worse for us.

* * *

Calling All Edisons

HOW IMPORTANT to us are the Soviet scientists? Here is one answer: Our National Science Foundation, during August and September, awarded a total amount of $482,519 in grants and contracts to 15 American societies, universities, government departments, etc., in support of improved dissemination of foreign scientific information. Twelve of these, totalling $395,955, were for translations, abstracts and publication of Russian scientific articles and journals. This ties in with recent statements of Dr. Edward Teller, the Hungarian who gave us that horror of horrors, the H-bomb, to the effect that within a decade the Russian scientists will be far ahead of any in the world.

After all, American genius has been expressed mainly in our practical application of foreign conceptions. We owe our telephones to Bell, a Scotsman; our 4-cycle internal combustion

TRY OBSERVATIONS By L. A. GRITTEN

engines to Otto, a German; our dynamos and motors to Faraday, an Englishman; our electronics to Thomson and Rutherford, both English; our atomic bombs primarily to Einstein and Fermi, German and Italian. Today we are dangerously dependent upon European brains for much of the success that we gain in the practical application of European ballistic and astronautical science. We need some more Thomas A. Edisons!

* * *

Beauty vs. The Pole Line Beast

"ONLY GOD can make a tree," wrote Joyce Kilmer. Only power, telephone and telegraph utilities can turn trees into anything so esthetically loathsome as the average pole line. In Seattle, where they have City Light and Bell System telephones, there is a strong movement afoot to rid the city of what is editorially denounced as the "Utility pole blight," and put everything underground. The heavy cost involved may delay the consummation of the plan for a long time, although considerable progress has already been made in Seattle's University district.

When the Cold War gives place to sanity — and in due course, like all postwar ferments, it will — we may expect a nation-wide campaign to remove these blots on the artistic cosmos. Good enough! That will be a better way to spend our brains and our reseources than building ICBM's for future Hiroshimas.

* * *

Solving The Program Problem

ROTARIANS in a little Michigan city wanted to hear their International president; but, having just returned from a world tour, he was a very busy man. Into the breach stepped Joe Stravers, manager of the Calhoun County Telephone Company. He arranged a station-to-station call. A "hands free" telpehone was provided. The Rotarians listened to their International V.I.P., sitting at his desk in Milwaukee. A question-and-answer period followed his speech. The program lasted 23 minutes and cost less than five dollars — thanks to a resourceful telephone man.

* * *

Make Sure They Know:

EVERY AMERICAN knows a little about the geology of Antarctica and how we propose to explore the moon and what happens in a Geiger counter. Does he know anything about your telephone company? Amazingly, the Pacific Gas & Electric Company, in a recent survey, found that one out of every three of its customers thought that its rates were not subject to regulation. So, the company has issued a publication telling them in detail the regulatory facts of life. That may be a good example for many of our companies. Not since that first telephone exchange in New Haven started operation eighty years ago have we been so badly out of touch with our customers.

* * *

A Hat Is A Hat

SPURRED by the TV quiz scandal, the FCC and the FTC intend to plunge us into an era of commercial purity. Exaggerated statements are taboo. They must give place to the cold truth and nothing but the truth. This dangerous innovation strikes at our very fundamentals. These United States were in part founded upon the most untruthful statement ever printed: "All men are created equal." Since then, the truth has been mercifully withheld from us, and we have grown great and prosperous.

However, if the government intends to inflict this horror upon us, it should at least take its own medicine. Last April, the Secretary of Labor vowed that if unemployment rose above 3 million in October, he would eat his hat. It did. He didn't. Instead he perpetrated an untruthful evasion by eating a small piece of a cake shaped like a hat. We call upon Secretary Mitchell to live up to his word and eat a real hat. We have one, slightly the worse for a few embedded fishhooks, that we shall be happy to send him.

* * *

The Christmas Spirit

WE SHOULD conclude with something about Christmas, of course. But what? Anything we could imagine has been said so many times. So for an example of the Christmas spirit, we cite something that happened months away from Christmas in a country that repudiated Christianity over forty years ago.

Ann Landers, the photogenic lady who has made a successful career of telling people what to do or not to do, to escape from what they have done or failed to do, recently returned from a trip to Russia. She was warned not to attempt to enter a Russian home. If she did, she would be met with rebuffs and suspicion. She and a friend, an American doctor, decided to find out for themselves. They went to an apartment, quite at random. They rang the bell. They explained that they were Americans who spoke a little Russian and they would like to talk. They were welcomed warmly by the three men, four women and a young girl, who occupied the small apartment, whose dinner they had interrupted. They were "wined and dined" — on vodka, sardines and salami.

As they left, after a happy, genuinely cordial hour, their hosts told them: "Tell your American people that we Russians are their friends." The men, by the way, were an accountant, a court recorder and, we are pleased to relate, a telephone man.

Most of our hates and our barriers are made by lack of communication. Perhaps our industry, more than others, may help to bring about that "Peace on earth, goodwill toward men" that is our only alternative to disaster.

To you and yours, a Merry Christmas and a Happy New Year!

— *Leslie A. Gritten*

FOR EVERYTHING YOU NEED

Kellogg is close by with fast, dependable

Nuts, bolts, cable, terminals, batteries ... you'll find everything it takes to run a telephone company under one roof at Kellogg. Eight completely stocked, conveniently located warehouses are only a phone call away. And when you call Kellogg you're talking with trained, experienced telephone men who understand your needs, know exactly what you require. For telephony's most complete source of dependable equipment, such as shown on these pages, and fast, efficient service ... call your Kellogg representative.

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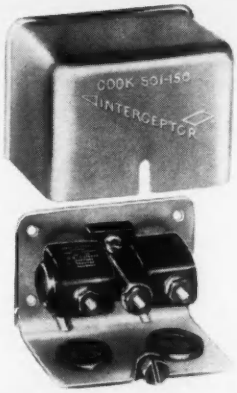
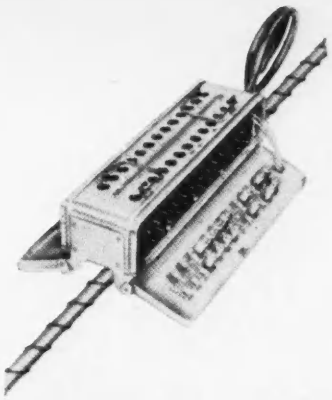
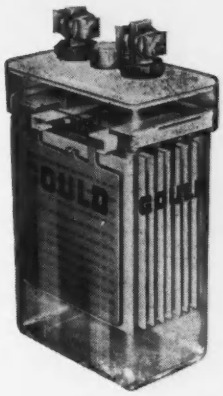


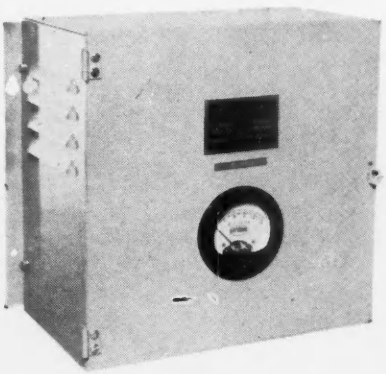
The Cook Interceptor is a fuseless, carbon-to-carbon arrester which grounds power cross surges and lightning. Minigap or Mytigap arresters are mounted in a moisture-resistant and dirtproof receptacle. A product of COOK ELECTRIC COMPANY.



The 26 Pair Cook Stranterm is available with plastic or lead cable stubs. Only strand mounted Cable Terminal designed for a flexible system of selective discharger protection. Can be supplied with either Minigap or Mytigap arresters. COOK ELECTRIC COMPANY.

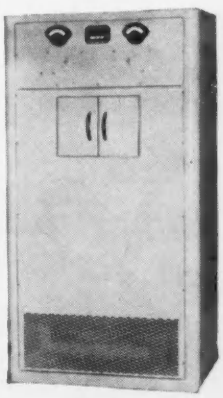


Outstanding Battery Performance is yours when you choose Gould Plante' Batteries. Thick, grooved, pure lead positive plates give many years of trouble-free service! Made by GOULD-NATIONAL BATTERIES, INC., the finest money can buy.



RECTIFILTER® Battery Eliminator. Completely self-contained source of DC talking and ringing voltage. When connected to a standard AC line, the unit provides continuous filtered 24 volt or 18 volt power for talking and 24 or 18 volt DC power for ringing. May be wall or floor mounted. RAYTHEON MANUFACTURING COMPANY

MoPeCo propane tent heaters give fast dependable heat to splicers working aerial cable in cold, wet and windy weather. Two sizes—8,000 or 12,000 BTU • 50 hr. maximum output, 20 lb. tank • Two 4-ft. adjustable chains • Low pressure regulator • 30-ft. L.P. gas hose • Weight: 9 pounds • Size: 10" diameter x 14" high. MORRISON-PELSUE COMPANY.



Self-Contained Unit—The 3-phase Flotrol Automatic Constant Voltage Battery Charger has no moving parts—all components in one cabinet. No separate units to install. Designed for plants requiring 25 to 400 amps charging capacity.
LORAIN PRODUCTS CORPORATION.

EVERY DAY... Call KELLOGG

complete service

Regional Offices and Warehouses:

CALIFORNIA:
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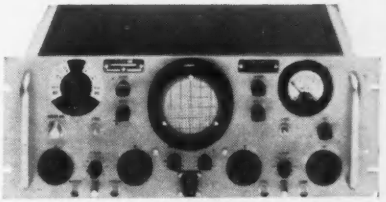
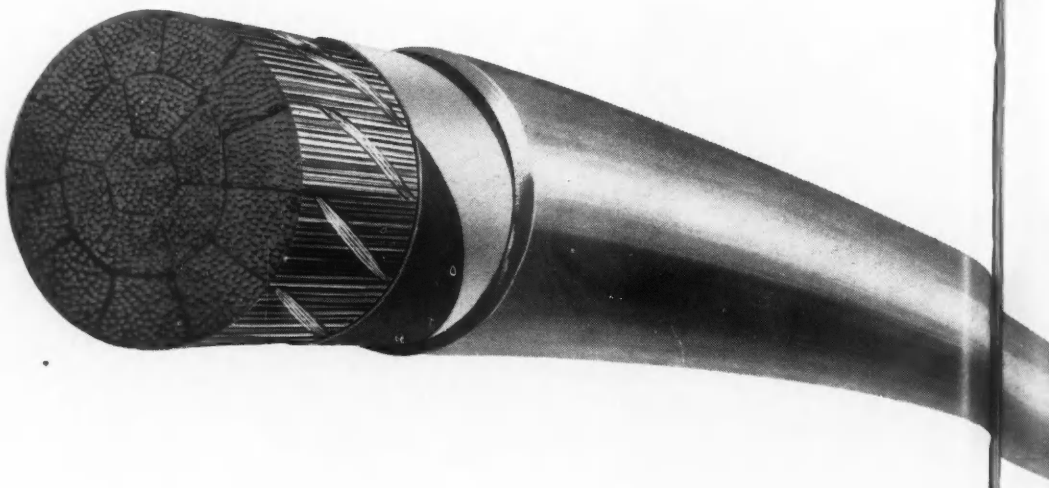
Crapo Tangent Supports for One-Pair Parallel Rural Distribution Wire. Made of tough, springy stainless steel wire (.109" diam). Coated with neoprene. Oval-shaped spirals provide close, uniform gripping action, reduce possibility of slippage. INDIANA STEEL & WIRE COMPANY, INC.



OSCILLOSCOPE especially designed for telephone work, Waterman Model S—12—CK RAKSCOPE. Signal amplifier has 50 millivolt sensitivity from DC to 1 MC. Sweeps are recurrent or triggered from ½ cycle to 50 KC. Balanced input with additional provisions for viewing either side of line to ground. Has many other features. Mounts on 19" rack, 7" high, safe 10" depth. Write for details.
WATERMAN PRODUCTS COMPANY



PHELPS DODGE TELEPHONE WIRE AND CA

THE "MINE-TO-MARKET" QUALITY LI

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ND CABLE
TY LINE!

Paper-Insulated Lead-Sheathed Telephone Cable

This Phelps Dodge telephone cable combines the superior transmission characteristics of paper insulation with the durability and moisture resistance of lead. It is backed by Phelps Dodge's extensive research and manufacturing experience in the paper-lead cable field.

The controlled craftsmanship and quality of this paper-lead cable are typical of the entire line of Phelps Dodge telephone wires and cables, including:

- Exchange Area Telephone Cable
- Self-Supporting Telephone Cable
- Rural and Urban Distribution Telephone Wire
- Interior Telephone Cable
- Rubber-Insulated Lead-Sheathed Telephone Cable
- PD—Tel Wire

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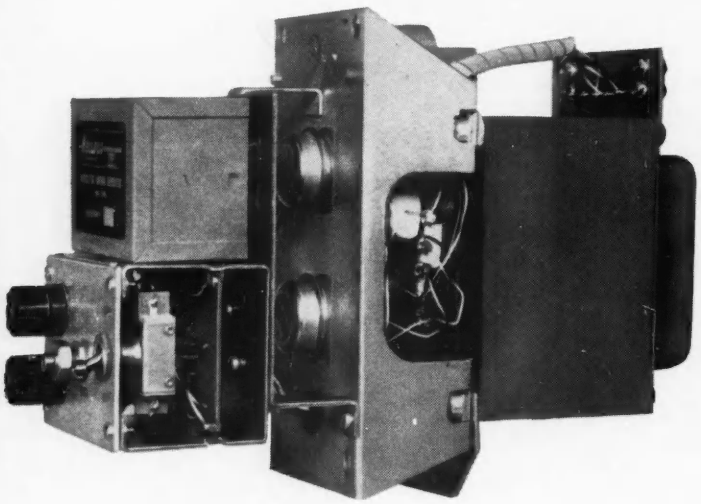
CORPORATION

SALES OFFICES: Atlanta, Birmingham, Ala., Cambridge, Mass., Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, Fort Wayne, Greensboro, N. C., Houston, Indianapolis, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N. Y., San Francisco, St. Louis, Seattle, Washington, D. C.

KELLOGG

Transistor Ringing Generator

low cost solution for ringing problems



- **Increased Ringing Power** – up to 50 watts output per ringing frequency.
- **Operates from central office power supply** – a second TRG can be used as standby, with no need for switchover equipment if commercial power fails.
- **Maximum flexibility** – same unit can provide harmonic, decimonic and synchromonic applications.
- **Minimum maintenance** – only reliable trouble-free transistors are used.
- **Plug-in components** – no moving parts, no contacts to clean, adjust or replace.
- **Extremely stable** – takes varying room temperatures, humidities, load conditions in its stride.
- **Adjustable** – any combination of five or fewer frequencies can be provided.

Ask your Kellogg representative to give you full details on this easy way to modernize your central office.

KELLOGG Communications Division of IT&T
CHICAGO, ILLINOIS

Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue, Chicago 38, Ill. Communications Division of International Telephone and Telegraph Corporation.

For complete list of offices see pages 54-55.

PEOPLE

World's Largest Steam Plant Sparks Company's Growth

NEW JOHNSONVILLE, Tenn., wasn't even on the road maps until very recently. Now it is home address for two very large industries and homesites sell by the front foot instead of the acre. In the midst of this breath-taking boom is *James Corbitt* and the Humphreys County Telephone Co.

Young JIMMY CORBITT and lineman BOBBY BURKETT in dial building of the Humphreys County Telephone Co. T.V.A. steam plant which sparked town's growth is largest in the world.

The T.V.A. Steam Plant which sparked the growth for the town and telephone company is the largest in the world. Like some other projects of this type, it provided a *supply* and thus created a *demand*. Industry, reacting strongly to the advantages of the situation, has literally sprung up out of a cornfield overnight.

Justification for the steam plant investment stems from this fact: applying present-day science in combustion principles to a generating plant that was newly constructed for this purpose, it creates power from low-grade bituminous that previously was dumped as waste. Its location on vast Kentucky Lake keeps transportation costs at the bare minimum.

For Jim Corbitt this headlong growth is not unlike riding a stallion bareback! The story of how he is providing telephone service in New Johnsonville will appear later.

PLIN THE INDUSTRY

CHARLES C. CHAPPELL (left) and FRANK D. FANCHER (right) receive their service certificates and gifts presented by LEE I. HUNT (center), secretary and general manager, on behalf of the 28 members of the Management Group of the Orange County Telephone Co., Middletown, N. Y.

Orange County Tel. Honors Chappell and Fancher

AT A SPECIAL luncheon meeting for the Management Group of Orange County Telephone Co., held recently at the Mitchell Inn in Middletown, N. Y., Orange County President, Charles C. Chappell, and Executive Vice-President, Frank D. Fancher, were surprised with the presentation of service certificates and beautiful transistor clocks.

Chappell, with nearly 48 years of service with the company, is now serving his 28th consecutive term as president and general counsel.

Chappell, a graduate of the Albany Law School, was admitted to the bar on November 13, 1906, and shortly thereafter engaged in private law practice in Goshen, N. Y.

His first association with Orange County Telephone Co. began on March 1, 1912 when he was appointed attorney for the company. On January 18, 1917 he was elected assistant secretary and attorney and one year later was elevated to vice president and attorney.

Following the death of Dr. Edwin Fancher, founder of the company, Chappell was elected president and general counsel on December 8, 1931.

Chappell has enjoyed a colorful and varied career. He served as president of the Board of Education and was mayor of the City of Middletown. He is a director of the First Federal Savings & Loan Association of Middletown; a director of the Orange County Trust Co., and until very recently was chairman of the Board of Trustees of Orange County Community College, having completed the first nine-year term of this newly organized institution. His hobbies are reading, higher education and the study of Abraham Lincoln.

Executive Vice President and Treasurer Fancher started his career with the company on December 9, 1908. Following his graduation from Pratt Institute, he worked for the New York Telephone Co. and the Western Electric Co. for a short period in order to gain practical experience in telephone work.

In December, 1931, Fancher was elected vice president, treasurer and general manager, and on March 1 of this year was promoted to executive vice president. His total service record amounts to nearly 51 years of continuous association with the telephone industry.

Fancher has been active in many organizations during the past 50 years. He is a member of the Masonic and Elks lodges, the American Legion and a former member of the board of directors of the YMCA. He has the distinction of being the only living charter member still serving on the board of directors of the New York State Telephone Association, and was reelected for his 39th consecutive term during the annual convention held on June 15th, this year.

His hobbies are painting and collecting antiques.

Charles D. Hansell

ON December 1 Charles D. Hansell left his post as general transmission and protection engineer for General Telephone Co. of Michigan, Muskegon and joined General Telephone Service Corp., New York City as transmission and protection methods engineer.

Hansell began his career with the Federal Telephone & Radio Corp., Clifton, N. J. as equipment engineer and equipment installation supervisor. In 1953 he joined General Tel. of Michigan as an equipment engineer and in 1955 was promoted to transmission and protection engineer.

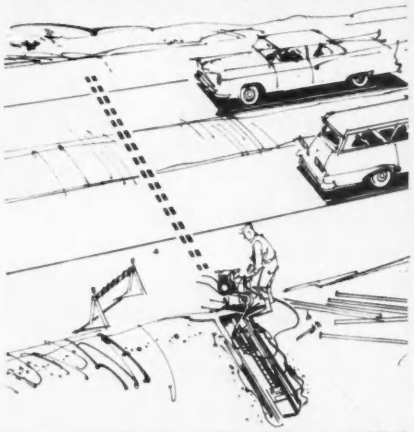
Russell E. Johnson Joins Warren Tel. Co.

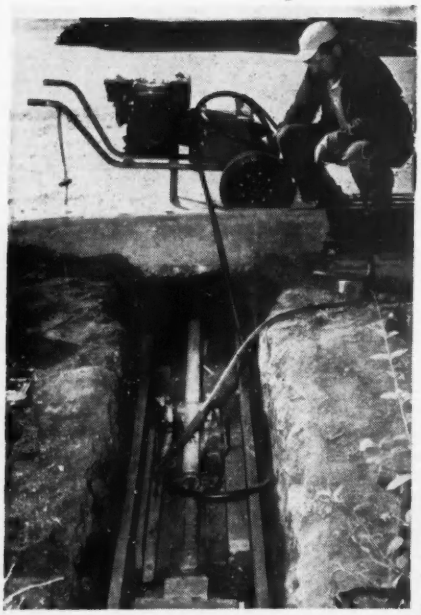
A FORMER vice president of United States Instrument Corp., Charlottesville, Va., Russell E. Johnson, has been appointed assistant general manager and chief engineer of the Warren (Ohio) Telephone Co.

From 1942 to 1946, Johnson served in the U. S. Army reaching the rank of Lieutenant Colonel. During this tour of duty he was engaged in training tactical troops in signal communications; supervised the Tactical Communications of 15 corps U. S. Third and Seventh Armies, serving as Executive Officer and Battalion Commander; and supervised the engineering, construction and maintenance of Civil and Military Communi-

Next page, please

EASY, LOW-COST WAY TO RUN PIPE UNDER STREETS AND WALKS





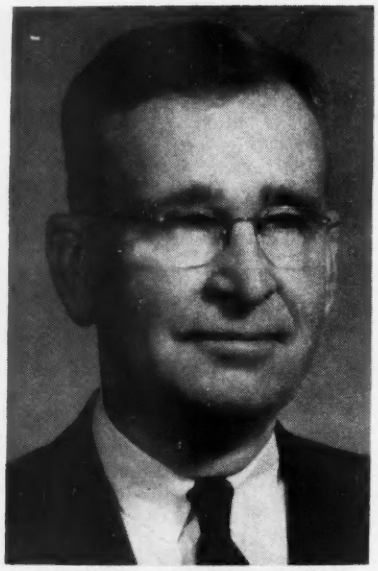
Greenlee Hydraulic Pipe Pusher

Traffic proceeds as usual when your piping for underground cable crosses under the street this simple timesaving way. Model No. 790 shown pushes ¾" - 4" pipe about two feet per minute with power pump. A small ditch in the parkway accommodates the pipe pusher — streets and walks remain undisturbed, total job time is cut to a fraction. Ask your supplier for details or write for free literature.

OTHER GREENLEE TIMESAVING TOOLS FOR TELEPHONE WORK: UTILITY CHISELS, POWER BITS, BRACE BITS, BELL HANGERS' DRILLS, ANGLE SCREW DRIVERS

GREENLEE TOOL CO.
1777 Columbia Avenue
Rockford, Illinois

GREENLEE



RUSSELL E. JOHNSON

cations in the exchange and toll center at Salzburg, Austria.

His business career began as a chemist and in power and telephone engineering with the Suburban Light & Power Co., Western Electric Co., Gustav Hirsch Organization, United States Department of Justice, Kellogg Switchboard & Supply Co., Lorain Products Co. and United States Instrument Corp.

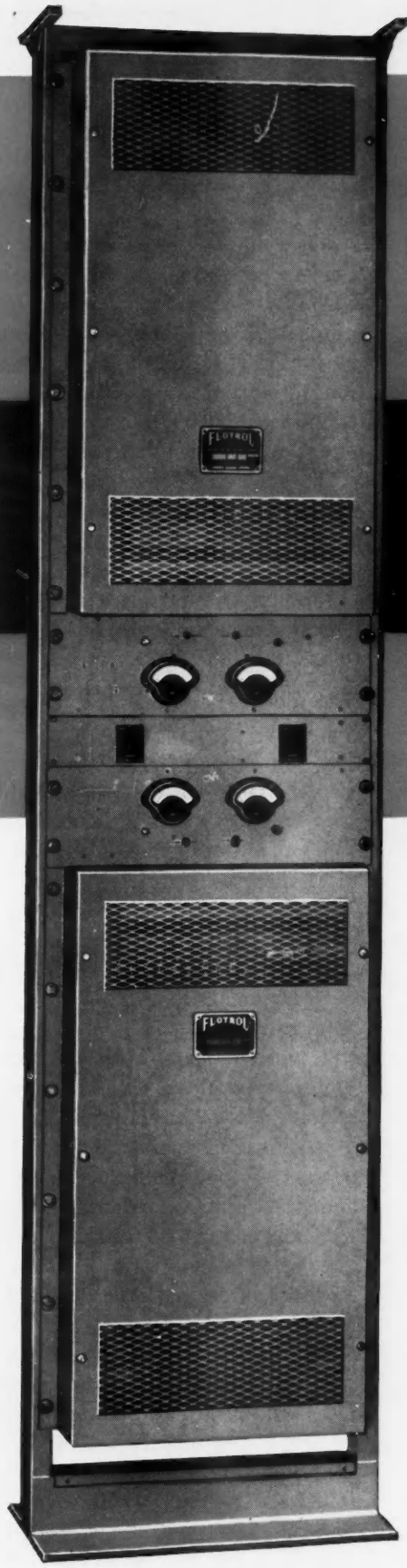
During the period from 1946 to 1957 while employed by Gustav Hirsch Organization as chief telephone engineer, Johnson supervised all central office installation work of that organization in the United States, Greenland, Alaska, Bahamas, Virgin Islands and Liberia, Africa. During this period he supervised the engineering and installation of the dial system, a 40-position toll board, a carrier system, several sub-exchanges, operator toll dialing and customer direct distance dialing on a nationwide basis for Warren Telephone Co.

Johnson is a registered professional engineer in Ohio. He is married to the former Mary Ball and is the father of two sons, both married.

What's Your Story?

TEM's new department — "People In The Industry" — has been created to keep you posted on activities of the telephone industry's men and women. To keep it going we need your stories and pictures. Send all material to: Editor, TE&M, 7720 Sheridan Rd., Chicago 26, Ill.

GILBERT SUMNER (second from right), City of Anchorage Telephone Co., Alaska, enlists some aid in packing the K-500 telephone he received as the 500th student graduated by Kellogg's COE maintenance training school. His helpers (left to right) are DICK REYNOLDS, senior instructor in the school; O. C. BAILEY, Kellogg vice president and director of sales, who made the presentation; and BART ARSENEAU, equipment engineer who spent several years with the telephone company in Alaska before coming to Kellogg.



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LORAIN

DUAL

FLOTROL CHARGERS

TWO STANDARD FLOTROL CHARGERS TEAMED TOGETHER FOR THE UTMOST IN FLEXIBILITY, SAFETY, COMPACTNESS

You get standby peak capacity or additional operating capacity — without using additional costly floor space!

The Lorain Dual Flotrol Battery Charger Assembly consists of two complete Flotrols mounted one above the other in a standard 23″ relay rack. The upper unit is inverted to bring all meters and controls to eye level, along with easy-access input and output leads. Total floor space: 24-3/8″ x 15″.

The two chargers can be used either individually, or continuously in parallel. In addition, an automatic control panel (optional) allows either Flotrol to be selected as the primary charger with the second unit automatically operated in response to load demands exceeding the capacity of the primary charger.

Maintenance work or replacement of either unit leaves the other in service.

Automatic proportional sharing of the load when operating in parallel is available on most of the 14 models.

Single-phase Duals offer a range of outputs from 24 to 48 amps. (input 230 or 115 volts, 60 cycles). Three-phase Duals cover 50 to 100 amps. Capacity of a Dual unit of less than maximum rating can be increased at any future time by substituting a larger Flotrol for either unit.

Lorain Dual Flotrols are offered in many combinations of chargers, controls and accessories. You can buy complete assemblies or any part you require. Get the full story.

Write for Bulletin 174A

THE ONLY COMPLETE LINE OF POWER EQUIPMENT FOR COMMUNICATIONS

our equipment is sold through leading telephone distributors

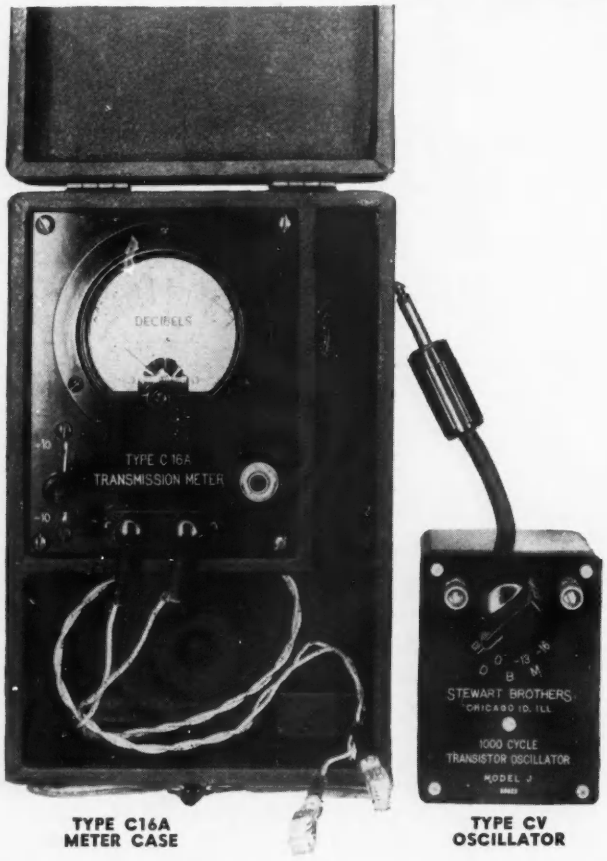
FLOTROL SUB-CYCLE

LORAIN *Products Corporation*

1122 F Street Lorain, Ohio Phone: ATlantic 8-9191

NOW! Check your Line Losses Easily . . .

End Customer Complaints of Poor Transmission



TYPE C16A METER CASE

TYPE CV OSCILLATOR

Use This Portable Type C16A

TRANSISTORIZED 1000-CYCLE GENERATOR AND DECIBEL METER

Take your own direct circuit readings from either end of cable —from any cable terminal to determine loading values.

Check and locate trouble in carrier systems and audio circuits.

Case measures 9½" long, 6¼" wide, 3¾" high. Weighs only 4 lbs.

Equipped with test terminals and test leads with clips—also jack for oscillator plug—meter scales read —10 DB 0 DB +10 DB.

Oscillator measures 2¼"x3"x4" and weighs 10.3 ounces.

Will operate 700 hours continuously—much longer, intermittently on self contained 2 cell mercury battery.

Sold through all telephone equipment suppliers—attractively priced—complete set $148.00 FOB Chicago, Ill.

COMMUNICATION EQUIPMENT & ENGINEERING COMPANY
5646 West Race Avenue • Chicago 44, Illinois
Phone EStebrook 8-3109

FREE LITERATURE

Plastic Cable Guide

A NEW Plastic Telephone Cable Guide is now available from General Cable Corporation.

This guide will be of great use to telephone personnel. While only 3 11/16″ in diameter it provides full information on Alpeth, DS-Alpeth, Supertel-1958A, Multipair Distribution Wiring and any other paired construction employing the standard blue-orange-green-brown-slate color code.

The guide enables the user to determine the relationship of any pair to the entire cable, and to pick out the pair number (1 to 400) binder group (1 through 16), and to see at a glance the color code for the pair and the color code of the binder within which the pair lies. *Check NP* 100.

Brochure Describes Copper-Plated Steel Wire

A NEW BROCHURE now available from National-Standard Co. describes Copperply®, its copper-plated steel wire. The brochure gives detailed information on the use of Copperply for bare and insulated communications wire, rural distribution wire, drop wire, guy and messenger strand, overhead ground wire, lashing wire, aircraft antenna, masonry tie wire, hose reinforcement, tinsel, decorative jewelry and critical electronic applications.

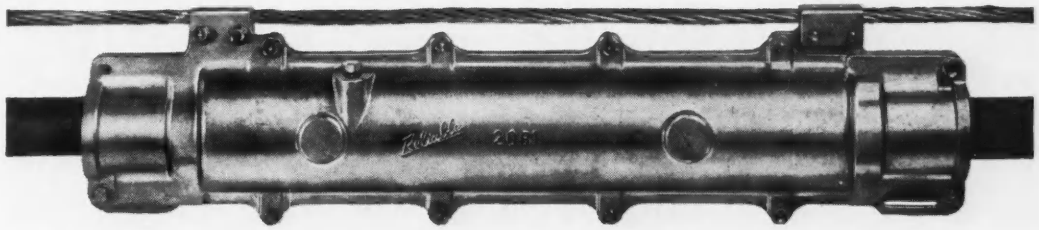
Specifications are listed for gauge tolerance, scope and grade, elongation, resistivity, torsion, bending, wrapping and frroxyl tests. Properties tablulated include sizes vs. copper thickness, breaking load, weight and resistance.

Copperply is manufactured by a continuous spiral plating process perfected and owned by National-Standard. The wire is REA-approved and conforms to ASTM Specification B-227 and Federal Specification QQ-W-345. It is available in weld-free lengths to 100 lbs. Standard 200-lb. coils, 800-lb. reels, and 1000-lb. reelless coils are available.

Bulletin 203 describing Copperply may be obtained free upon request from *National-Standard Co., Dept. TE&M, Niles, Mich.*

Now from Reliable...

splice cases



For use with lead, Alpheth and Stalpeth sheathed cables up to 1.6″ diameter.

and

splice case terminals

Single terminal — 6, 11 and 16 pair.
Two terminals, back to back — 12, 17, 22, 27 and 32 pair.
Unprotected or protected.

Reliable ELECTRIC COMPANY

11333 Addison St. • Franklin Park, Illinois

Send us your Installation Specification No. 104 and additional information on these splice cases and splice case terminals.

Name _____ *Title* _____

Company _____

Street _____

City _____ *Zone* _____ *State* _____

Available with pushbutton platform controls, too

Push a button and the new Holan Series 2600 Ladder goes up; push another button and it comes down. The pushbutton station is on the mast—and a station can be installed on the upper side rail for the man on the platform.

Pushbutton control is just one operating feature. For precise spotting, you have a needle valve with a long handle that enables you to accurately guide the ladder down. You rotate with a crank located directly behind the ladder; this provides a better view for spotting, avoids left-hand cranking and gives maximum clearance between body wall and ladder. And, you crank the fly ladder out *and in* with a windlass.

Important non-operating features include: light-but-strong tubular support frame; heavy duty ladder hooks that engage two rungs at a time; optional protective fiberglass covering on side rails; and optional metal rungs. Heights to 32 feet, 360° rotation, 72° elevation.

Holan Corporation, 4100 W. 150th St., Cleveland 35, Ohio
Plants in: Cleveland, Ohio; Griffin, Georgia; Phoenix, Ariz.

Holan

Subsidiary of THE OHIO BRASS COMPANY

HOLAN

Just off the press!

A NEW COOK CATALOG

for your convenience when ordering the finest

TELEPHONE PROTECTION & DISTRIBUTION EQUIPMENT

The new Cook catalog has fifty pages printed in three colors and is jam-packed with all the latest information on the *best* telephone protection and distribution equipment. It has illustrations showing the equipment installed, with product descriptions, sizes, weights and part numbers. All products are alphabetically indexed and the pages are bound in an attractive three ring, Vinyl cover. Send for yours today!

Clip Coupon

Please send the undersigned a free copy of the new Cook Telephone Protection and Distribution Equipment Catalog as soon as possible.

12559

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

COOK ELECTRIC Company
Since 1897

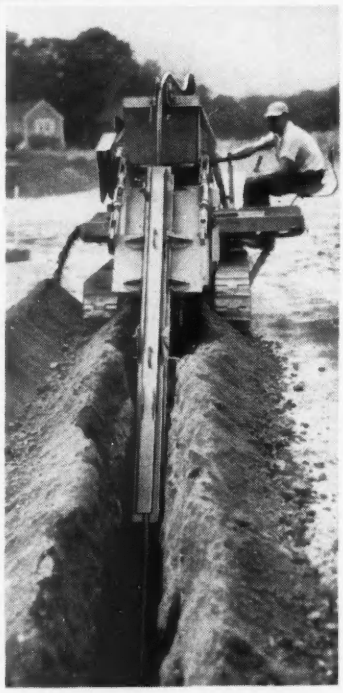
2700 Southport Avenue Chicago 14, Illinois

PARSONS® utility-size 77 Trenchliner

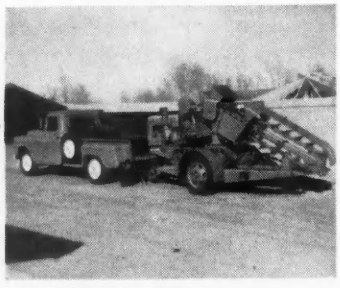
LAYS CABLE
as it digs trench....

Take a look at this fast one-man trenching and cable-laying crew. Telephone company removed crumber on 77 Trenchliner, added a custom-made cable-laying attachment — and the 77 installed cable as it dug trench. On new housing developments, or in any congested areas, it's just right size for fast, efficient operation. Only 3 ft.-10 in. wide; 5 ft.-8 in. "low". Turns within own length.

Small in size but heavy-duty in every respect, this 77 has a work range that will surprise you. It opens 4.4 in. to 21 lineal ft. of trench per minute — 6 to 18 in. wide — depths to 5 feet. Positive down-crowd action on telescoping ladder boom starts cut fast — holds accurate grade. Boom undercuts walks, curbs — makes vertical set-ins. Self-cleaning, cast steel buckets are equipped with removable, self-sharpening, point-type teeth. Reversible, power-shift conveyor places spoil bank on either side of trench. See Parsons distributor today, or write for catalog.



Cable installation at this new housing project was put on production line basis! Crumber on 77 Trenchliner was removed, cable-laying attachment installed — and the 77 laid cable as it opened trench.



Transporting the 77 Trenchliner from job to job is fast and easy. No big expensive hauling rig necessary. Conventional tilt-trailer and truck haul it. Only weighs 6700 lbs. Narrow width and low height well within highway clearances.

Mail to: PARSONS Company, Newton, Iowa

Please send us bulletin on 77 Trenchliner®.

NAME.....

TITLE.....

COMPANY.....

STREET.....

CITY, STATE.....

P911 TE

PARSONS TRENCHLINERS
A DIVISION OF KOEHRING COMPANY

WASHINGT

THE NATION'S biggest customer for communications and many other services, the federal government, has been told by the watchdog of its exchequer that its practices in buying the services show a lot of room for improvement.

Widespread changes in administrative practices of the government agencies were urged in a report by the General Accounting Office, in a report made to Congress as part of its function in checking on the various methods by which federal agencies spend money.

In view of the growing decentralization of government communications requirements, in connection with such programs as SAGE and upcoming plans to link Titan and Atlas missile sites, the GA report is of considerable interest to all segments of the communications industry.

Area of the GAO report was limited entirely to private line telephone service. It said, however, that its comments and recommended actions probably apply equally to teletypewriter and similar services.

The report, entitled "review of management of leased private line telephone facilities in the Department of Defense and selected civil agencies," was transmitted to House Speaker Sam Rayburn and Vice President Richard M. Nixon, and distributed among various interested Congressional committees, but it made no recommendations for legislative changes.

To a large extent, the report followed along the lines of a draft distributed last summer to interested groups for comments, except that it was brought up to date with references to the comments, principally from the American Telephone & Telegraph Co., General Services Administration, Department of Defense, and Federal Aviation Agency.

Instead of the original draft's recommendation that the government be

NGTON OBSERVATIONS

By ROLAND DAVIES and FRED HENCK

considered as two customers for purposes of applying the AT&T Long Lines Department multiple channel private line service tariff, one defense and one civilian, the final version suggested that the entire government be treated as a single customer under the multichannel offering. The tariff provides lower rates, computed by GAO as between 2.5% and 28% lower, when a customer with three or more channels between the same two points combines them into a multichannel service.

AT&T expressed no opposition to the proposal to treat the government as a single multichannel customer, provided the proper administrative machinery could be set up to prevent the Bell System from incurring vastly increased expenses in connection with ordering, billing, etc.

The GAO report did not cover local exchange or long distance telephone service, and was limited entirely to telephone grade private line.

AT&T and GAO were sharply at issue on the question of whether the multichannel tariff should be automatically applied whenever a customer has three or more telephone grade channels between the same points, whether he has ordered multichannel service or not. GAO contended in its report that the same private line telephone service is being offered under both the "overlapping" private line telephone and multichannel tariffs, while AT&T took the position in its comments that the multichannel service is a separate offering with different characteristics, and that automatic application would discriminate against the customer under certain circumstances.

The two organizations also differed on the retroactivity of the multichannel tariff application, with AT&T expressing itself as ready to apply the multichannel tariff on request from eligible customers, but unwilling to

Report issued by General Accounting Office criticizes practices of federal government in buying communications services. GAO states comments limited to private line telephone service but "comments and recommended actions probably apply equally to teletypewriter and similar services."

make refunds covering past periods when customers did not elect to take service under the multichannel tariff.

Under the heading "required action," GAO declared that "Each department and agency of the government should take prompt action to secure the proper application of (the multichannel tariff) to all eligible circuits. Each department and agency of the government should make a claim for the amount of overcharge arising from the improper application in the past of (the tariff)."

In criticism of existing internal government procedures relating to communications management, the GAO report keynoted that "The significant increases in government expenditures for leased communication facilities over the last several years warrant a comprehensive review and appraisal of all aspects of management in this area. To the extent that it is practicable, steps should be taken to insure government-wide coordination of leased private line telephone and telegraph services in order to take full advantage of possible joint utilization of existing leased facilities, technological data, negotiation experience, most economical tariff provisions, etc.

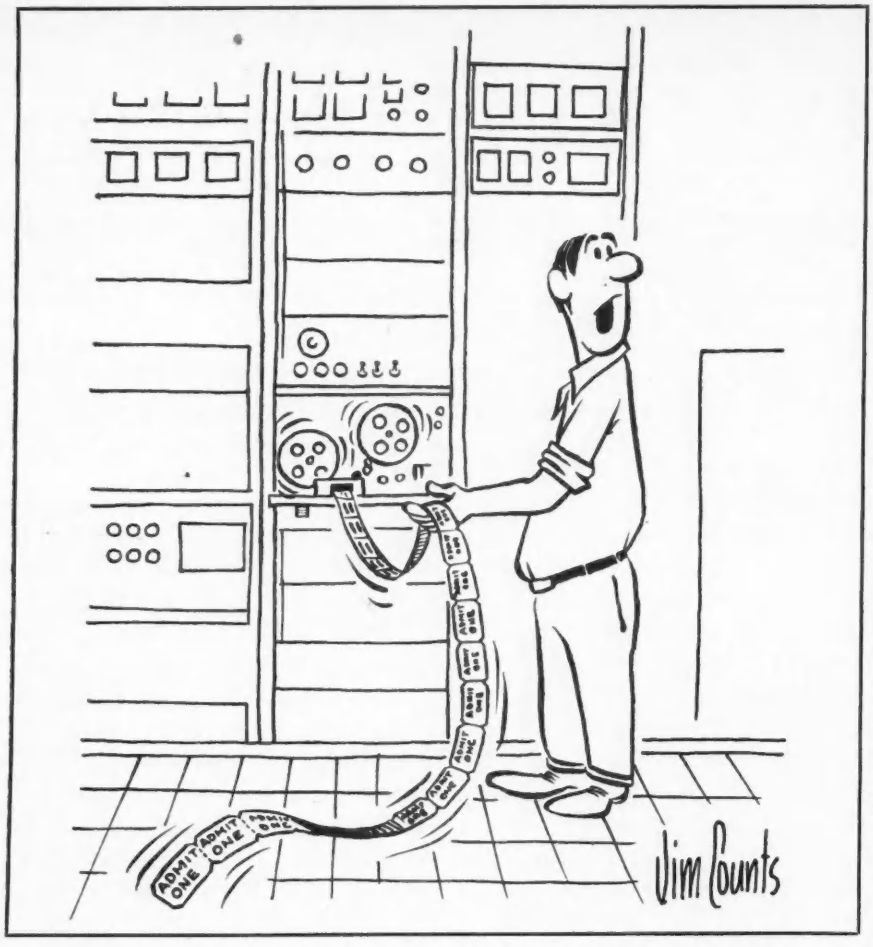
"While such coordination should not affect the present responsibilities of the individual departments and agencies in the determination of their requirements and procurement of services, we believe that there is a need for centralized review of broad over-all requirements. However, the differences in military and most civil agency requirements, organizational structures, and operating procedures would not warrant the establishment of a single group in the government.

"In our opinion, therefore, central management can best be accomplished by DOD's assuming active leadership with respect to the military establishment and possibly FAA; the latter because of its close relationship to DOD, particularly in the control of aircraft and during a period of national emergency. GSA should take the lead for the balance of the civil agencies. This arrangement should not preclude coordination between DOD and GSA, nor an interexchange of experience gained by the two groups.

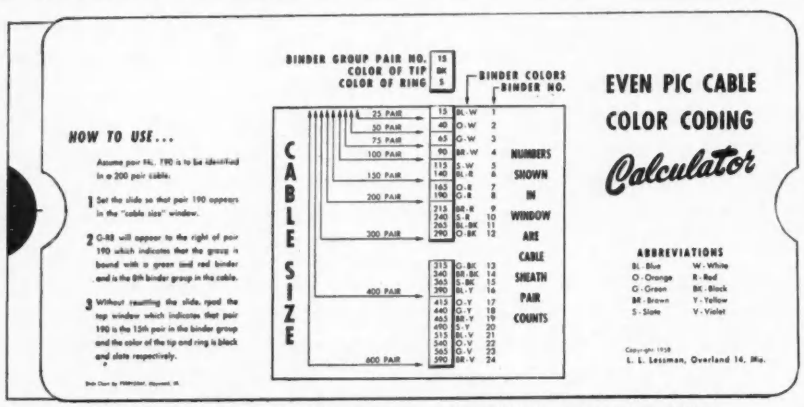
"Government personnel engaged in the administration and procurement of leased communications facilities needs to be trained in the technical phases of the services required as well as the proper interpretation and application of appropriate tariff provisions. Stated simply, government personnel must be in a position to more effectively deal with the telephone industry. Internal audit programs of each department and agency should provide for effective reviews of communications operations and costs.

"We recommend that (1) the Secretary of Defense take action to establish a central control over the management of leased private line telephone and teletype communications within the military establishment, to include coordination with FAA, and (2) the (GSA) Administrator, take similar action with respect to the remaining civil agencies, including those now exempted from GSA jurisdiction. In this connection, DOD and GSA should coordinate and exchange information and experience gained with the objective of achieving the greatest economy for the government.

Continued on page 40



Hey! . . . Something has gone wrong with this ticketing machine!



THE EVEN PIC CABLE COLOR CODING CALCULATOR

Use this slide-chart Calculator to convert color coding of Polyethylene Insulated Conductor (PIC) cables into cable pair counts, or vice versa. You don't have to have a degree in engineering to operate this device. A housewife, with no knowledge of telephone cable can operate it.

To identify pair #190 in a 600 pair cable merely set the slide-chart and in less than 10 seconds the answer peeps through little windows. Amazing speed! Amazing accuracy too, because the windows are so arranged that only 4% of the data on the cables are shown at one setting.

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"Also, we recommend that the need of each department and agency with sizeable private line telephone and telegraph requirements take action to institute a communications management improvement program, including provision for internal audit."

GAO reported that "although our study was limited to private telephone lines, in view of the potential savings to be realized, we are further recommending that the Secretary of Defense and the (GSA Administrator) make a study, in their respective areas, to assume that all teletype circuits are receiving the multiple channel rates and are ordered on an interstate basis where appropriate."

Another area of the report, in which GAO and AT&T appeared to be in general agreement, was GAO's recommendation that the "Secretary of the Air Force take action which will insure prompt identification of specific Air Force aircraft control and warning intrastate circuits which are appropriate for switching to interstate networks, and that orders covering such circuits be placed with AT&T as soon as each determination is made."

In this section of the report, GAO said that AT&T's "stated principles" make it seem clear that "it was intended to classify the great majority of circuits utilized in the air defense system, as well as those used in connection with aircraft communications or aircraft tracking, as interstate circuits. AT&T deems it appropriate to classify all channels used in connection with SAGE radar stations tracking planes in flight over other states as intrastate, even though they may be physically interstate. Therefore, the channels and circuits used in connection with AC&W radar stations which also track planes in flight over other states would appear to warrant similar treatment.

"Since savings to the government can be realized, we believe that prompt action should be taken to reorder intrastate circuits connected with interstate circuits by switching arrangements, wherever justified, in order to realize the benefit of the lower rates applicable to interstate service. — *Roland Davies & Fred Henck.*

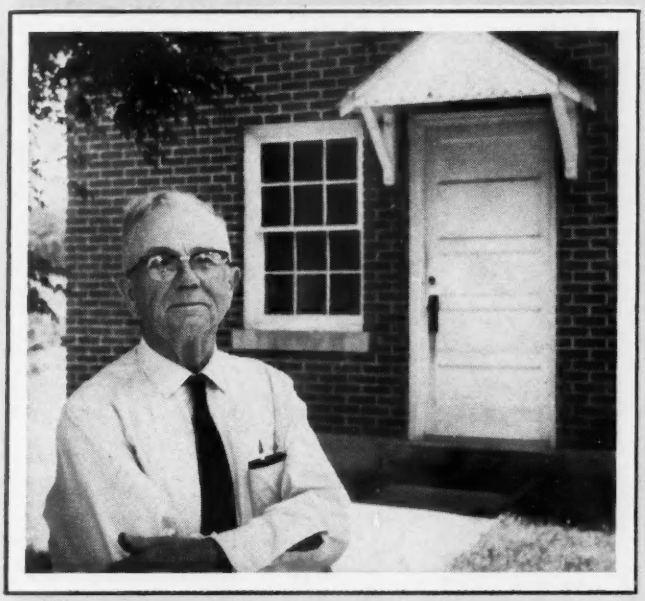
RAYTHEON

in the power field

NEWS ABOUT RAYTHEON TELEPHONE POWER SUPPLIES

Raytheon Company, Industrial Apparatus Division, Manchester, New Hampshire

RAYTHEON RECTICHARGER STILL IN SERVICE AT PEOPLE'S MUTUAL (VA.) AFTER 20 YEARS



Mr. E. B. FITZGERALD, president of People's Mutual Telephone Company with headquarters at Gretna, Virginia. The company founded by Mr. Fitzgerald's father 80 years ago serves over 1,600 subscribers in Gretna, Hurt and Renan, Va. Raytheon battery chargers are used in each of the three central offices.

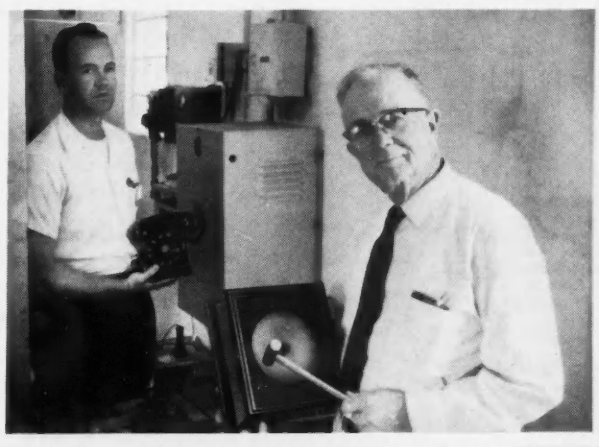
Unit installed in December, 1939 when 80-year-old-company switched to dial

"Ours is a concern that grew from the most humble beginnings", explains E. B. Fitzgerald, president of People's Mutual Telephone Company, now headquartered at Gretna, Virginia.

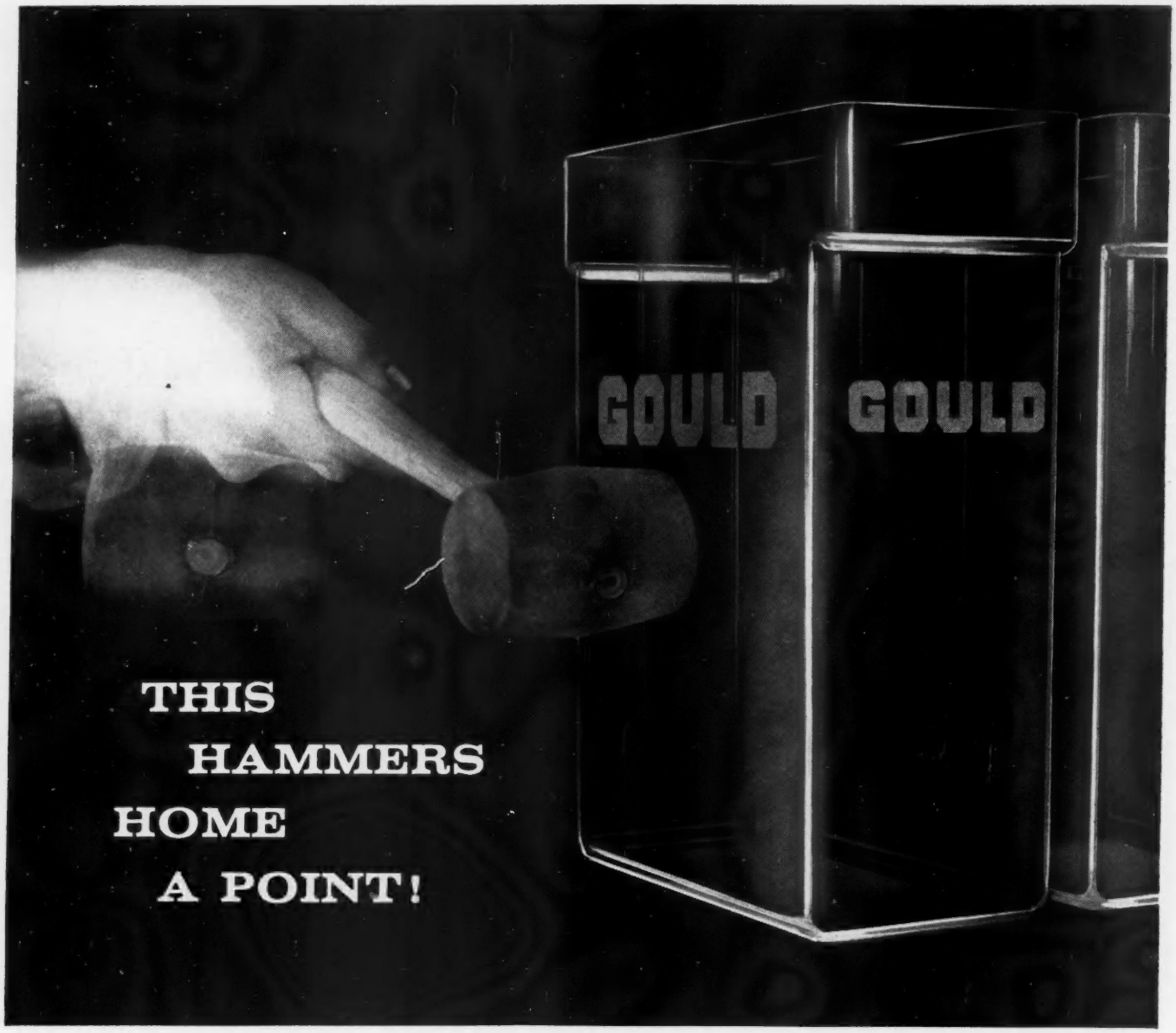
Mr. Fitzgerald goes on to explain that his father established a primitive communications system between his home and office some 80 years ago--the first installation using a large box-like diaphragm which acted as both mouthpiece and receiver.

When the company converted from magneto to dial in December, 1939, a Raytheon Recticharger was installed. Since that time, Mr. Fitzgerald reports, "despite the fact that our subscriber list has grown over fourteen times, the 3-ampere, 50-volt battery charger has performed its task with top efficiency, without failure or maintenance problems". Each of the company's three central offices is now equipped with a Recticharger.

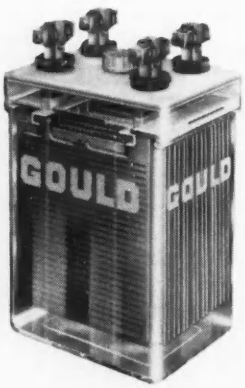
E. B. FITZGERALD and E. B. JR. compare modern dial telephone with early telephone instrument used by the elder's father 80 years ago. The senior Fitzgerald demonstrates an early method of "ringing" by striking the diaphragm with a rubber hammer to attract the distant party. The twenty-year-old Raytheon Recticharger is on the wall between them; batteries are at bottom left.



To learn about the Raytheon 1960-model telephone power supplies introduced at the U.S.I.T.A. convention, please write to Raytheon Company, Manchester, N. H., for the latest product data.



Gould Stationary Battery Jars are Practically Indestructible



New Stationary Batteries in Plastrite Jars offer the same long life for which Gould has always been famous.

Gould Plastrite Jars have a higher tensile strength than most Stationary Battery Jars . . . will withstand greater impact than ever before! This means you'll be free from breakage in handling and shipping.

Plastrite Jars are a feature of Gould's all new batteries for stationary service. Lighter weight makes the jars easier to handle . . . original shape maintained because of higher heat resistance, higher elongation characteristics of Plastrite material.

Same Capacity, Smaller Size. Gould Plastrite Jars save you 30-40% floor space . . . give you the same capacity in a smaller size battery. They're available in Planté, Calcium, and Kathanode. For more details, write today or call your local Gould Office listed under "Batteries—Industrial" in the "Yellow Pages." Gould-National Batteries, Inc., Trenton 7, N. J.

More Power to you from **gould**

EDITORIAL

"In the Year Ahead"

SOME philosopher has said "*it is a good thing for humanity that time is divided into years.*" Undoubtedly he is right. Under the system we can, at least every 12 months, have the feeling we are starting out fresh, new, and vigorous, with a new year before us — a blank, white page as yet unmarked by our mistakes, misdeeds, and our general cantankerousness.

That's why we believe that *now*, a few days before the end of 1959 and the beginning of 1960, is a good time for looking at a few items that will deserve the telephone industry's attention in the months ahead.

We are in agreement with industry members who believe that in planning for the future the number one goal should rightfully be the responsibility for making sure all units of the telephone business are kept modern and strong in all respects — in service, operating efficiency, financial integrity, and in the relationships the companies have with the people they serve.

However, we believe another subject rates next to service as a major item that deserves the attention of all mmbers of the telephone industry: *greater participation by businessmen in solving the political and social problems confronting the country.*

This responsibility was recently emphasized by *Erskine N. White*, president of the New England Tel. & Tel. Co., in an address presented at the convention of the Telephone Association of New England.

"*As we face the challenges of these changing times,*" Mr. White stated, "*we as telephone management must see that our companies broaden their concept of community living. We must include government officials at all levels within this concept because the laws they pass or administer will determine how well we in the telephone business can meet future public demands.*

"*Recently our company took a new look at the relations we have had with our government officials. We wanted to make certain that we were doing our part in keeping them informed, and in making it possible for these officials to clearly understand the problems and the needs of our business. . . .*"

As we feel sure it would do for other companies, the study New England Tel. & Tel. made of its relations with government officials proved (1) the subject had not received the attention it deserved; and (2) employes had not been encouraged to become active, as private citizens, in shouldering some of the duties the democratic form of government requires of its citizens.

The final result of New England Bell's reassessment was the organization of a public affairs program for the company and for its employes. This program is a part of the company's over-all public relations activity, and it has two parts:

(1) As a company, New England Bell will not take a partisan stand on any candidate or issue. It *will* speak out, however, on those issues which directly affect the telephone business.

(2) The telephone employe will be encouraged to exercise his right — and perform his duty as an individual citizen of this country — to take an active part in the affairs of his government.

With a busy political year ahead, it seems to us that now is the time for the adoption of similar programs by more companies. Actually the success of our democratic system depends upon widespread participation, and we well know that too often our representatives are forced to base their decisions on the opinions of a few because so many silent thousands have abdicated their roles as active citizens.

Mr. White summed this up very capably when he said: "*What we are talking about is not lobbying for a purely selfish cause. We are talking about getting to know our government officials better and helping them to know the problems and objectives of all business better because the laws they pass control the very way we live and move. . . . We also are encouraging more citizens — telephone employes — to help with the big job of running our government.*"

And it is a big job. If business defaults by failing to participate in solving the political and social problems confronting the country, that default may not be as destructive as another world war, but it will be just as effective in ending our way of life.

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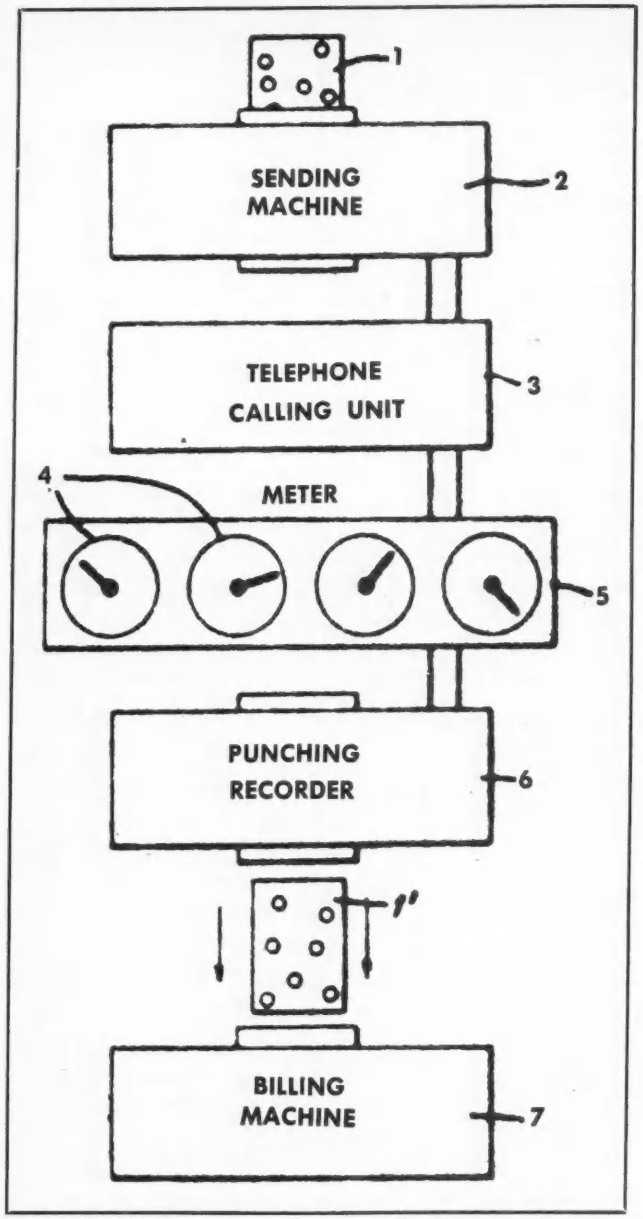


FIGURE ONE: — General schematic showing the combination of principal elements involved in the invention.

Automatic Meter Reading via Telephone Lines

New Automatic Meter reading device will use telephone lines to transmit the dialing pulses and the meter reading pulses.

By JOHN S. REED

WHEN A utility meter is to be read, the meter reader enters the premises of the customer to examine the meter dials and record the information. If the customer is not at home, the man has to leave a card for the user to enter the meter reading. The utility company relies on the meter man's books and the cards to obtain the consumption data for billing the customers.

A recent invention promises to do away with the use of meter readers and completely automate the billing procedure, including the reading of the customer's meters. A patent has been granted to the joint inventors, W. Arthur Sprague, accounting department head for New York State Electric & Gas Corporation, and Curtis M. Cooper, partner in a Binghamton TV service concern, for a device to permit automatic reading in any home which has a telephone, and the automatic transmission of the data to office computing and billing equipment of the punch card type.

The inventors devised a scanning unit that is easily adapted to existing meters, thus eliminating the need to obsolete a large number of good meters. The equipment as presently designed will take 300 to 360 meter readings per hour, the inventors state. They feel that, with further development, this speed can be doubled; also, that it will be practical to use leased long distance lines so that one billing center can serve several community exchanges.

The over-all circuit is illustrated in *Figure One.* The system is operated by punch cards (1), each of which has been previously prepared by punching according to customer's name, address and telephone number. Feeding the cards into the sending machine allows contacts to energize the circuits of a telephone calling unit through the punched holes. If the line is clear, this energizes the reading elements (4) on the customer's meter at the other end of the telephone line. These elements send back successive short electrical pulses to punching recorders of the step-by-step type which accumulate the data and then punch the meter reading on a customer's billing card. The mechanism is then cleared for the next customer.

According to the patent application, no persons are involved in the operation. The principal data are carried by a series of uniform short pulses. After the punch cards have been punched with the meter readings, they

**Adapted from article "Is Automatic Meter Reading on the Way?" by William Nickel, published in "Gas Age," February 19, 1959.*

are then passed to regular punch card operated billing machines, so that the entire process is substantially automatic.

The sending machine has a number of solenoids and contacts, each corresponding to a digit of the telephone number (1 to 0, 10 to 00, etc.) as indicated in *Figure Two*. Each contact controls a corresponding solenoid, for example, the contact for dial number "1" can close the solenoid switch for dial number "1."

The contacts of the punch card operated sending machine pass current over circuits through holes which have been punched in the card while all other circuits are blocked where the contacts pass over unpunched areas of the cards. To assure that the card is fully inserted before any of the contacts are made, a microswitch (12 in *Figure Two*) supplemented by a one-second thermoswitch (13) is provided. This controls the circuits of all the contacts and is closed only when the punch card is correctly in place, the controlling switch being operated by the edge of the card or a particular hole or notch.

Telephone Calling Unit

IN THE telephone calling unit, each digit number storage unit (*Figure Two*) comprises an insulated plunger plate having a series of electrical contact teeth corresponding to whatever is the number of the digit to

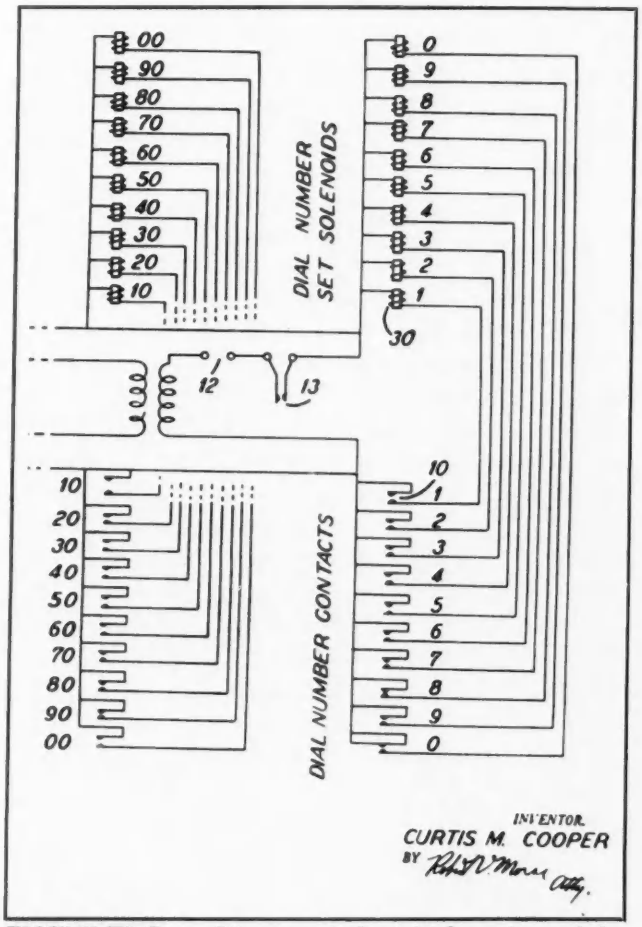


FIGURE TWO: — Diagram of the initial portions of the sending machine into which prepared punch cards can be automatically fed to prepare the telephone circuits to take meter calls.

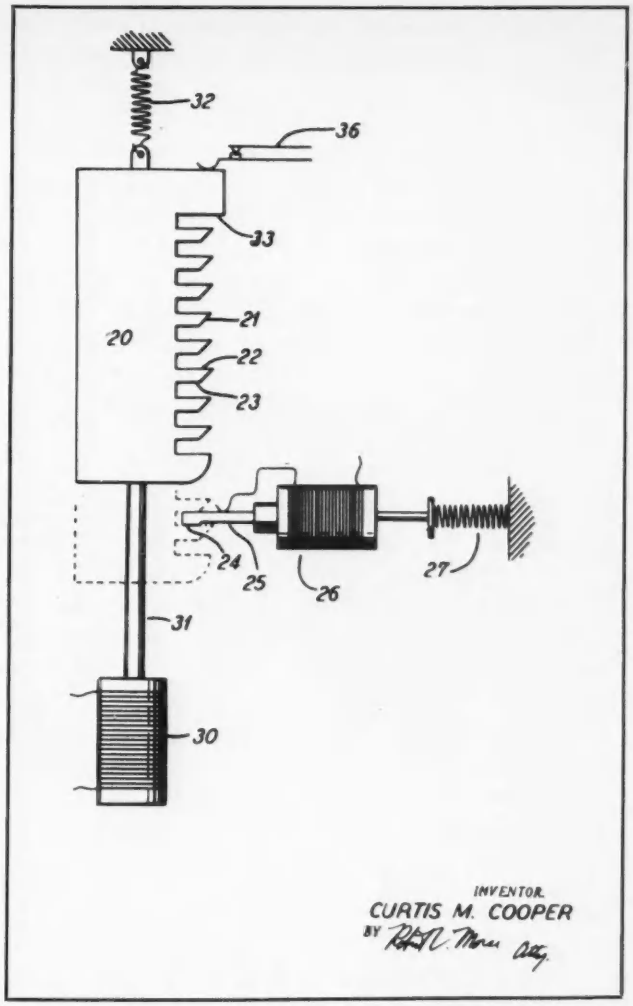


FIGURE THREE: — A view of the storage section of the telephone calling unit of the sending machine. Solid lines show resting position; broken lines, the cocked or transmitting position.

be dialed. The storage unit illustrated is nine-toothed; for digit number 5, the unit would have five teeth, and so on for other numbers.

Each of the nine contacts shown has a conducting face on its upper side (22 in *Figure Three*) and an insulating tooth (23) supporting the conductor. This insulating tooth is beveled to facilitate the entry of the stepping contact at the end of the plunger operated by the dial number release solenoid (26). The plunger is forced into the teeth by an expansion spring (27) and is withdrawn by the operation of the release solenoid.

A setting or cocking solenoid (30), when electrically energized, pulls down the plunger plate (20) against the tension of the feeding or dialing spring (32) until the end (24) of the contact plunger (25) strikes the stop (33) at the upper end of the series of teeth. This plunger is then forced by its spring into the upper notch of the toothed series and holds the number storage element cocked until needed. The same is done in other units for as many as there are digits in the calling numbers of the exchange, these storage units being similar except for the number of teeth or contacts involved.

To operate through the telephone central office, the

storage units are released in the same order that one would use in dialing. This successive operation is accomplished by the closing of upper end switch (36) when the plunger (20) reaches the end of its return travel after each of the contacts has sent out a dialing pulse. The operation of the end switch passes the action on to the next storage unit, this action being repeated for each successive unit.

By this means, the dialing numbers set up by a punch card are transmitted in a few seconds through the central office to the particular customer's telephone line. This connection is then held just long enough to transmit the meter reading back to the receiving punch card machine.

At Customer's Location

FIGURE FOUR shows the operating elements at the customer's location after the circuit has been set up. The apparatus includes elements associated with the various meter shafts to pick up electrical pulses corresponding to the meter reading and transmit them back to the company's accounting office. In this illustration, two of the meter dials and the associated wiper or pick-up mechanisms are shown, but the principle is the same on all the dials.

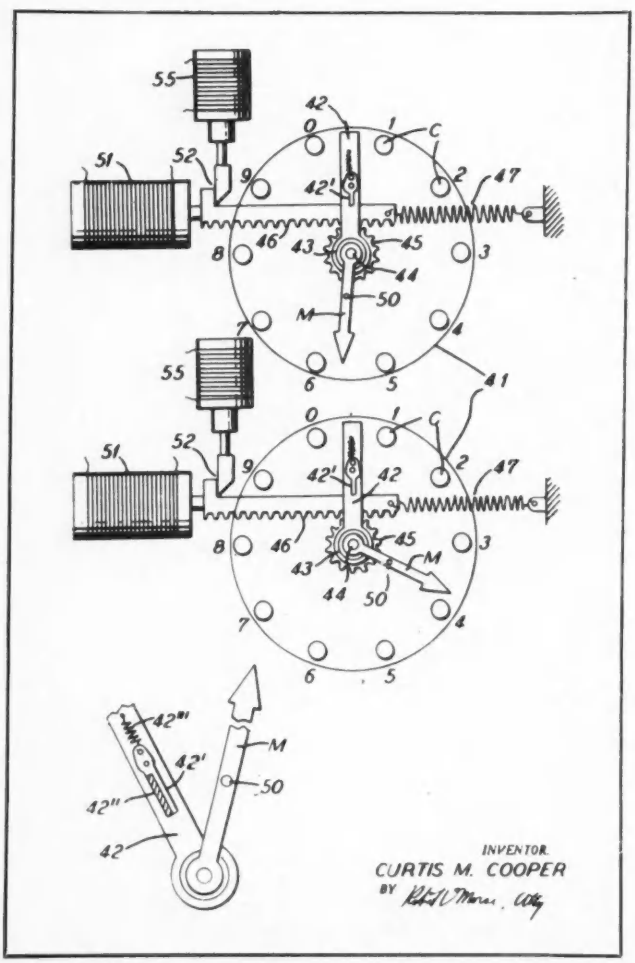


FIGURE FOUR: — A diagram of the wiper mechanism mounted on the customer's meter by which an electrical contact is moved over each digit of the meter dial, creating successive short impulses which are transmitted via telephone line to the punch card receiving machine. Inset at bottom is a detail view of the wiper arm contact.

The same pick-up mechanism is employed for each of the meter dials and is energized successively in the proper order. Each meter dial has the usual reading digits, one to ten (zero) inclusive. At each of the digits is an electrical contact point with which contact can be made by a wiper arm (42). As the wiper arm passes over the contact points it sends pulses to the receiving machines at the company's accounting office corresponding to the number of points contacted.

The sweep of the arm over the points is effectuated in the following manner:

The arm is mounted on a shaft (43) which is concentric with or an extension of the meter shaft (44) so that, while independent in action, they turn on the same center line. This shaft can be rotated by the pinion (45) driven by a rack (46) actuated by a spring for clockwise rotation, so as to move the wiper arm successively over the numbered contact points until the wiper arm contacts the meter hand (M). This sends a number of electrical impulses corresponding to the meter hand reading which go back to the machines in the accounting office.

When the wiper arm reaches the meter hand, it connects with a stopping contact (50) on the hand which closes a circuit energizing the cocking solenoid (51) to pull the rack back against the tension of the spring and rotate the arm in a counter-clockwise direction to its original cocked position. In so returning, the wiper arm again travels over the same contacts in the opposite direction; but resulting pulses do not interfere with the reading pulses previously transmitted, because these secondary pulses are shorted out by the receiving mechanism at the accounting station.

When the cocking solenoid pulls the rack to the left, the trip (52) of the release solenoid (55) engages the rack and holds it in the cocked, or resting, position for the wiper arm. This resting position is not quite the same as the zero position on the dial, otherwise it would continuously close the zero contact point. On return of the wiper arm to the resting position, a contact is made which activates the release solenoid of the next meter dial unit for sending its own reading over the telephone line to the accounting station, and so on for as many dials as there are on the meter. This takes but a short time, after which the apparatus at the meter is cut off by the ten-second cam in the time control unit at the accounting office and the receiving apparatus there will then turn to another customer's meter.

Before a number can be dialed, the line must be tested for busy condition. A connection is first made that is sensitive to the dial tone, and if the dial tone is present, the connection is maintained to allow the meter reading to come through. When a busy signal is noted, a kick-out switch tosses out the punch card and restores all the numerals in storage to their initial position to accept the numbers from the next card. It is generally desirable to operate this meter reading mechanism in the quiet hours after midnight when very few lines are

Please turn to page 74

By JAMES L. MORRISON

General Commercial Superintendent,
West Coast Telephone Co.,
Everett, Wash.

Preparing For The Rate Case

Why not turn the necessity for rate relief into a "golden opportunity for presenting telephone problems to the public in an educational and interesting manner?" Part One of this article appeared in the Dec. 1 issue of TE&M.

Think It Through

THE TELEPHONE business under regulation is a goldfish bowl business. You are subject to continuing inspection and must file all manner of financial and operating reports. There is little opportunity for secrecy and deviousness.

These are the facts of telephone life — facts that aren't likely to change. Why not, then, turn the necessity for rate relief into a golden opportunity for presenting telephone problems to the public in an educational and interesting manner? This proposal is based on the belief that the public is willing to pay a higher price for telephone service if that service is satisfactory and the need for relief is understood.

It would be easy in this material to assume that your service is good or, at the very least, toss in a comment that your service ought to be good. What we really mean to say is your service MUST be good.

We are a monopoly and monopolies have been cursed because they breed complacency. Even regulation breeds complacency. You've heard telephone men speak about their "entitlement to a fair return." An opportunity to earn a fair return is the only entitlement we can claim. The public doesn't owe us a living. On the contrary, we owe the public the best telephone service possible and in return for the opportunity to provide service we'll be mighty thankful if they send us a check once a month.

Before we paused for a little preachment we were at the point where our budgets signaled the probable need for rate relief, say, in six months. Notice means opportunity and at this point you need to do some heavy thinking. Take a few days and go fishing. If you have my kind of luck, you'll have plenty of time in which to think.

"How About Your Service?"

JUST WHAT KIND of service do you give? If it's good, can you make it better? If you think of something that is needed to further improve service, write it down.

If service is not good, your problem gets sticky. A customer is justified in contending that poor service doesn't deserve a price increase. To him it is nothing more than insult upon injury. Clearly, then, it is your job to improve service as quickly as possible, preferably before you seek rate relief.

Often, however, a service improvement program cannot be financed unless you secure a rate order. Now your problem is really sticky but you can succeed. You should prepare an improvement program, line up the

financing and then go to the public and the commission with your honor-bound promise to institute the improvement program. The commission probably will give you a rate order, but with the increase to become effective after the improvements are completed.

This is probably the best you can do and at that you may be lucky. From everyone else's point of view you may be somewhat responsible for poor service in the first place. In addition, the commission can remember at least one telephone company that promised to improve service, received an immediate rate increase, and then failed without good reason to keep its promise. This explains why most commissions are very reluctant to take anyone's word for the future.

After you've thought about service, consider your company and the area it serves. If you are growing at all, enumerate the work already accomplished and add those projects needed to meet future growth. The figures should be available because you thought about this when you were preparing your capital additions budget.

Consider your operating expenses. Since your last increase in rates it's probable that wages and taxes have gone up and will go up some more. You should have, however, some evidence that wages and taxes will be higher. Two paragraphs ago we mentioned the outfit that promised to improve service and then failed to keep the promise. Well, that same outfit also promised to raise employe wages and a year later the commission learned that wages were the same.

How are business conditions in your area? If you are in the third year of a depression, a drought has ruined crops for two years, and a tornado smashed your town last spring, it would be best if you tried to hold off a rate increase until times are better. On the other hand, if most folks are driving late model cars and if most houses are sprouting TV antennas, then chances are good that the natives can afford a few more pennies a day for good telephone service.

You may need to do some financing in the near future. If so, try to line up the money in advance so the details are available when you start working up your rate application. Financing usually means more or better telephone service and this will give you a good talking point with customers.

How is the political weather? If you just had a big fight with the Chairman of the House Ways & Means Committee, and if that Committee determines the utility commission's appropriation, then you might have a bit of difficulty with a rate application, at least while the legislature is in session. Ordinarily, however, small telephone companies aren't political fodder. Actually, the small company has more than once pulled big company chestnuts out of the fire.

How aggressive are you? Both the commission and the public have a right to expect that you are doing everything you can to develop revenue before you seek a general rate increase. Chances are you could pick up some easy money by selling more directory advertising. A few credit cards in the right hands would probably earn you some toll revenue. Do you push extension telephones or are you strictly an order taker? These are just a few of the opportunities which you should be pursuing.

Briefly, we have considered a number of ways to size up your present situation. Most, if not all, of these factors will come out at a rate hearing. Advance thought now will not only help you decide whether or not you should seek an increase, but will also help you develop pointers to be used in selling a rate increase and alert you to weaknesses which either can be corrected or at least anticipated as "opposition" arguments.

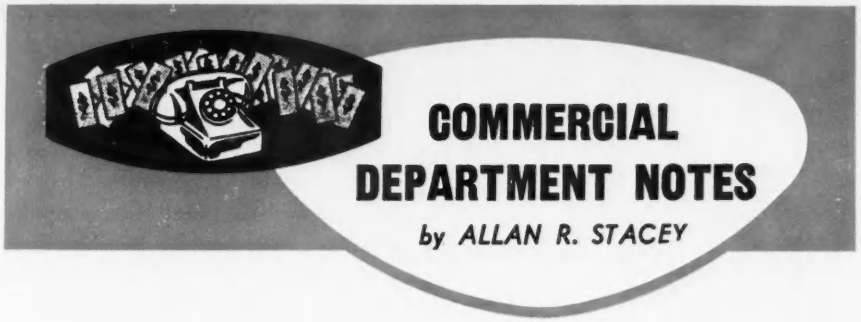
Chances are you have no alternative but to proceed with the rate application. If you take a good look at your situation before filing, you can avoid involvements which might raise more problems than solutions. More than one telephone company has entered a rate case only to come out saddled with a restrictive order to improve service and half a rate increase. The old saw about an ounce of prevention still has a lot of merit. — *To be continued in the Jan.* 15, 1960 *issue.*

Probably you have had at least two rate proceedings in the past 15 years. Chances are the proceedings were somewhat distasteful. But you have had a lot of company, for no one likes to go through a rate proceeding. It is not a simple process, but the tips Jim Morrison will give you in each chapter of his new series will prove that proper preparation for a rate case makes rate relief easier to obtain.

We hope each TE&M reader will carefully study each chapter of Mr. Morrison's article. His suggestions will prove that the company seeking a rate increase has an opportunity to do more than win a rate case. With adequate preparation, the company can educate its customers, build good will, and win new friends . . . (And here's a tip — TE&M's Educational Division will prepare a book containing all chapters of Mr. Morrison's article following publication of the complete series. Let us know how many copies you will need. The price will be $1.00 per copy.)

EDITOR'S NOTE

In the January 15, 1960 issue of TE&M, Mr. Morrison will point out that there is one major factor which determines your ability to obtain rate relief — your customer relations. If you missed Chapter One of this article write the Editor of TE&M for a free copy.



"Yardstick For Measuring Profitability"

Are extension telephones and instrument changeouts always profitable? Here's how one telephone company developed a plan for measuring the degree of profitability for each situation.

ON THE masthead of this column is a picture of a telephone instrument with dollar bills scattered behind it. To me the telephone instrument represents service and the dollar bills represent profit. The commercial department of any operating company is responsible for both service *and* profits. Today let's talk about the profitability of extension telephones and instrument changeouts.

The author, ALLAN R. STACEY, is vice-president of the Sunland-Tujunga Tel. Co., Sunland, Calif.

Are Extensions Always Profitable?

SOMETIMES we assume that extension telephones are always profitable because so little plant investment is required compared with investment for a primary station. Now this may not be true. There are circumstances under which extension telephones may be installed at a rate of return no better than the company-wide average and possibly less because of today's high cost of the instrument.

Consider the variety of ways under which an extension telephone may be installed. Certain ones are profitable and others are not. Some companies have high installation charges, others have low. Sometimes companies waive extension installation charges under special circumstances. Again, higher installation charges might be made when the extension is in color, or we might make up the color increment in monthly rental.

It is not possible for a categorical answer to be given on extension profits because the operations of no two telephone companies are exactly comparable. The best thing we can do is look at several types of situations involving extension stations and discuss a yardstick which will measure the degree of profitability for each situation.

Measuring Profitability

IN ORDER to develop a yardstick for your company you might look at the following illustration which shows items to be considered in determining profitability of installing a black extension telephone on the basis of a special trip to the premises. *Caution* — this is illustrative only and will not apply directly to your particular company.

Revenues	
Service Connection Charges	$ 4.00
Monthly Rental (three years)	41.40
Total Revenues	$45.40
Less: Uncollectible Revenues @ .364%	.17
Net Revenues	$45.23
Expenses	
Maintenance (three years)	$ 4.68
Depreciation (three years)	8.43
Commercial (first year for service order only)	1.15
Revenue Accounting (first year for service order only)	.38
Taxes on Book Cost (three years)	3 15
Sub-Total	$17.79
Taxes on Income (three years)	13.35
Total Expenses	$31.14
Net Income (three years)	$14.09
Net Income (one year)	$ 4.70
Plant Investment & Working Capital	
Plant In Service	$37.84
Net Plant & Working Capital	$32.89
Rate of Return (per year)	14.3%
Working Cash Capital	.26
Less: Depreciation Reserve	5.21

The above does not mean that anytime we install a black extension telephone we'll have a rate of return of 14.3%. What it tells us is that under *these particular circumstances* for *this particular company*, the installation of a black extension telephone is more profitable than the average rate of return for the company. You will want to study your own circumstances.

What's Your Location Life?

ONE OF the first things to do is to determine how long an extension will stay in one location and not have to be processed again through your company. A review of your service orders will give your best clue. Several companies have found the expected one-location life of a telephone instrument to be 36 to 48 months. Naturally, this varies in various sections of the United States.

What's Your Cost Per Service Order?

THE SECOND item to consider is your cost per service order handled. Others have found that in round dollars it might cost betwen $2.00 and $4.00 for each service order processed throughout a telephone com-

You are invited . . . to tell our authors about problems on which you'd like to have an opinion.

While we don't claim to have all the answers, we'll welcome the opportunity to discuss as many as possible in TE&M's regular departmental columns . . .

pany. This could be $2.00 for the plant man's visit to the premise and $2.00 for the clerical processing of the order through other departments.

In order to draw some comparisons, let's make a few basic assumptions of the revenue factors involved and then apply our yardstick. First, let's assume, for purposes of illustration, that a black extension will draw a $4.00 installation charge unless the instrument is installed at the same time as the primary service. Second, a $10.00 non-recurring charge is added if the extension is in color. What happens under these circumstances?

Extension Installed With $4.00 Connection Charge

USING a yardstick developed in the manner described above, when the subscriber orders installation of a black extension instrument with a $4.00 connection charge imposed, the rate of return can be 14%. Adding a $10.00 non-recurring connection charge for placing the extension in color rather than black raises the rate of return to 18% when both the $4.00 connection charge and the $10.00 color telephone charge apply on a non-recurring basis.

What would happen if you waived the $4.00 connection charge?

Extension Installed Without $4.00 Connection Charge

SEVERAL companies across the country have filed tariffs which permit installation of an extension instrument without assessing a connection charge.

Under these circumstances, for our illustration, the black extension instrument may bring an annual rate of return of 12% with a three to four year location life. If the extension instrument were in color, the rate of return might be 16% per year.

Sometimes we have filed tariffs which permit "free" installation of an extension telephone at the same time as the primary service is being installed. A discount is offered in order to induce the applicant to take extensions as well as primary service. Obviously, if we make a 12% or 16% rate of return with this extension installation on the basis of a special trip to the premises, our rate of return is higher if we are able to install the extension simultaneously with the primary service. The extension installation gets what amounts to a free ride.

Instrument Change — Black To Color

WHAT HAPPENS to our operations when an eager beaver service representative sells a lot of customers the substitution of a color instrument for a black one? At least two methods must be investigated in measuring profitability of changing black instruments to color. One method assumes the black instrument being removed will subsequently be installed for another subscriber. The second method assumes that the black instrument will *not* be marketable to another subscriber and must be retired.

Looking at the first circumstance where the color telephone goes in and the black one will be reused, we may find that the rate of return on the *additional* investment associated with the color increment of the instrument is between 2% and 3%.

Got a problem?? Write it down and send it to TE&M, 7720 Sheridan Rd., Chicago 26, Ill. Our editors will be glad to help you!

The second position, assuming no reuse of the black telephone removed, is one in which companies are finding themselves today because often the black instrument is an older shape and style and will not be desired by today's subscriber. As a consequence, we are faced with retiring a good, working black telephone and replacing it with a much more costly color telephone which may bring in little or no more monthly revenue.

Assuming that the black instrument cannot be reused and that the company collects a $10.00 revenue for installation of the color instrument, the above yardstick shows a $19.00 total expense over the three-year location life of the instrument, or a $9.00 net loss on the changeout transaction.

Examine Your Own Experience

AGAIN, I say the above comparisons will not apply to each and every operating company. The best they do is give some profitability hints to use in examining our own tariffs and practices. They indicate that where the installer makes a special trip to install an extension and the service connection charge *is adequate*, the rate of return, or profit, can be good. They indicate that changeout of an instrument from black to color might be *unprofitable* to a company, particularly if the black instrument must be retired.

It appears that a company's efforts should be directed toward (1) selling an *additional* extension in color or black, or, (2) selling primary service in color along with installation of color extensions at the time of installation of primary service.

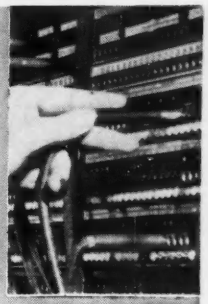
Green Light To "Traffic Lights"

IT WAS certainly a pleasure for me to learn that my friend, *Al Perigo*, who authors TE&M's *"Traffic Lights,"* makes his department an every-issue feature effective with the January 1 issue of *Telephone Engineer & Management*. Congratulations, Al!

Next issue we'll talk about the cost of processing service orders. See you then. — *Allan R. Stacey.*

"Traffic Lights"

By D. A. PERIGO



Should She Say "Forty Forty" or "4040"?

What about transposed digits?? On the West Coast an experiment is under way and some Information operators have dropped the old plan of saying "RO 4-4040" and are saying "RO four-forty forty."

USITA Traffic Conference

THE USITA Traffic Committee presented four speakers at the Traffic Conference of the National Convention in October —and every one of them lived up to his advance billing. While the speakers were from larger companies the subjects covered have a great deal of application in any size company.

In a small company the president may also be the manager, the lineman, and the traffic engineer — but as the traffic engineer he could learn a lot from the remarks of Mr. Childers. There should be no question concerning Mr. Garnett's remarks about customer relations, for every company must be interested in its customers, beginning with the very smallest. While Mr. Beck's remarks on some of the economic aspects of traffic management related to his company, they have an application to every company in varying degrees. Mr. Hamper's discussion of management development could easily point out that a small company manager may need to do some self development of his own.

We think small company managements sometimes overlook the important point that larger companies operate a lot of small exchanges too.

The experience of operating small exchanges in a large company can be most beneficial to the fellow who operates a company consisting of one small exchange. We urge the small company manager to give serious consideration to such discussions instead of saying "That's big company stuff. I can't use it."

The Author, D. A. PERIGO, is general traffic superintendent of the West Coast Tel. Co., Everett, Washington.

Experiment Of Interest

IN THE October 1, 1959 issue of *Telephone Engineer & Management* we wrote about "Proof of Value" and said this: *"With all due respect to the operating practice people of all telephone companies — big and small — it is really the girls at the switchboard who provide the ideas for practice changes. Why not use their ideas more effectively?"*

Here is one which came to us through an Employe Suggestion Plan:

"In working the information desk in the Kirkland traffic office, I find the subscriber has a tendency to transpose the number given, and also requests the number repeated regardless of how clearly or slowly the operator gives the digits. This slows down our service.

"I have been experimenting and find when I say "MA 4-3456" they will nearly always ask me to repeat.

"However, if I say "MA four-Thirty-four fifty-six" or "VA two-thirteen eighty-one" they will usually respond by saying "Thank you VERY MUCH" or "Thank you, operator," and I have found I can give faster service by this method.

"Maybe I'm wrong by having tried this and you may not approve at all, but I like working for West Coast Telephone Company and appreciate my job. Thanks for letting me tell you about this."

This raises a good question about transposed digits. Is there any item that wastes more time for the Accounting, Commercial and Traffic Departments than transposed digits? Think of the ways "one three eight one" can be transposed. — Now, how can you transpose "thirteen eighty one"?

We decided to give the suggestion a try. The experiment is now under way. In order to get some comparisons we divided the Information team so some operators use the standard method and some the suggested method. We are not ready with any conclusions as yet but can report a couple of interesting observations.

First, requests for repetition by subscribers are definitely less than with the standard method *BUT* — requests for repetition from distant operators are much higher than with the standard method.

Second, comments from subscribers are very favorable, many saying it is easier to remember, *BUT*—comments from distant operators are generally unfavorable even to the point of side remarks (with the customer on the line) such as, "She doesn't even know how to give out numbers."

Third, we discovered a local radio

ENGINEERS

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MEMORANDUM

TO: Company Managers

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station was using the suggested method in its commercials, so we discussed the subject with them and found they have been experimenting for over a year. They tell us they can prove they get a greater response to commercials when they say, for example, "Call Alpine 9 — sixty-seven seventeen."

Perhaps some of our readers would like to share their opinions on this suggestion before we make a final report on the subject.

Christmas Greetings

WE ARE DEEPLY grateful to all of the fine people who greeted us at the Chicago Convention. As we think back over those few days we can recall comments from most branches of the industry — Bell, Independents (from all departments and all sizes) — suppliers, and consultants. We were particularly pleased with the remarks of one consultant about our "Proof of Value" in the October 1 issue of Telephone Engineer and Management. He said his thinking was stimulated to the point of realizing he was paying a very high rent for space which was occupied by records and studies that are so old they are meaningless — and he is planning to do something about it.

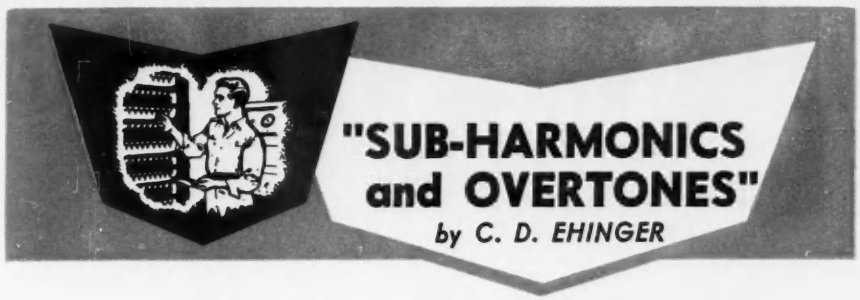
Outstanding to me was the number of times reference was made to the philosophy expressed in the very first sentence of the Introduction to *Traffic Lights* in the August 15 TE&M. *"If any job is worth doing at all, it is worth doing right."*

We take this opportunity to wish you a Merry Christmas and hope that in the brightness of a New Year you will press on to the accomplishment of new and higher goals. — *D. A. Perigo.*

SUBMIT YOUR PROBLEMS

You are invited . . . to tell TE&M authors your problems of department policy or procedure on which you'd like to have an opinion.

While we don't claim to have all the answers, we'll welcome the oportunity to discuss as many as possible in our columns . . . and that could be helpful to you and others with the same (or equal) problem.



"The Kid Learns About Pulse Distortion"

The Instrument Repair department sent a "slug" of dials and instruments to Central Office for dial checks. In the process the Kid learned a little about pulse distortion.

JIM DESMOND, equipment supervisor, sat at a table in the coffee lounge of the Centerville exchange and somewhat moodily sipped his coffee. For some unexplainable reason this was one of those days when everything seemed to be going wrong.

Chet and Bill were deeply involved in the installation of a 200-line addition to the central office equipment and had just left Jim. In the course of their conversation they had sheepishly admitted to Jim their discovery that one of the cables, among the many, which they had laced to the cable runway had been mistagged. When he had talked to Chet and Bill, Jim had found it hard to keep the irritation from his voice. There was no solution except to cut all lacing, pull out the incorrect cable, and to run the correct one. It meant at least a half day completely lost.

Jim could hear a couple of operators, over at another table, busily talking. Jim couldn't help but idly muse, "I would certainly think that an operator on her relief period would want to *stand* and *be quiet*. Instead of that, they always seem to *sit down* and *to gab* away like magpies during their relief period."

Chuck Is "Bushed"

CHUCK PARR, one of Jim's trusted assistants, walked into the coffee lounge, drew a cup of coffee and walked over to Jim's table.

"Hi, Jim — I'm sort of bushed this morning."

"What's the matter with you, Chuck? As I remember, you're on a rather easy schedule this week."

The author, C. D. EHINGER, is president of Citizens Tel. Co., Decatur, Ind.

"It isn't the work, Jim, but, if you'll remember, I'm paired up with the Kid this week."

Jim chuckled. "Well, that sort of explains it. What's the matter, is he giving you a bad time?"

"No — he always wants to pull his own weight but maybe that's the trouble. Sometimes he can be so dog-gone eager that he practically drives me into putting out a little more than usual from the standpoint of being a 'teacher.' He can ask the darndest questions, but I suppose it is good for me to have to keep ahead of him and review some of the stuff myself."

The two old-timers finished their coffee in silence. As they stood up to leave the table, Chuck fired a parting shot: "Jim, I sure would appreciate it if you would take the Kid under your wing for a half hour or so. He is deviling me about a problem right now and I am not certain I can give him the right answer."

The Kid Was Testing Dials

JIM WANDERED over into the equipment room of the Centerville exchange and to the test bench. The Kid was seated at the test bench in front of an array of a half dozen telephone dials, several dozen telephone instruments, and had a pulse-measuring meter in front of him.

"Good morning, Kid," Jim commented, "How are things going?"

"Oh, Hi, Jim! All right, I guess."

"What in the world *is* all of this, Kid? How come the telephones, the dials and the pulse-measuring set?"

"Didn't Chuck tell you about it, Jim? Telephone Test and Repair, out at the warehouse, called in late yesterday afternoon and asked Chuck if someone up here could check out a slug of dials and telephones and mark them for percent-make and speed."

Jim bristled slightly. "No, I didn't know about it! How come those bozos are sending their work up to us? They have all the facilities to do it and we certainly have our hands full now with everything we have to install and check out."

The Kid was somewhat defensive: "All I know about it, Jim, is that Chuck told me to quickly check out each of these dials and these telephones for percent-make and dial speed and to tab each one."

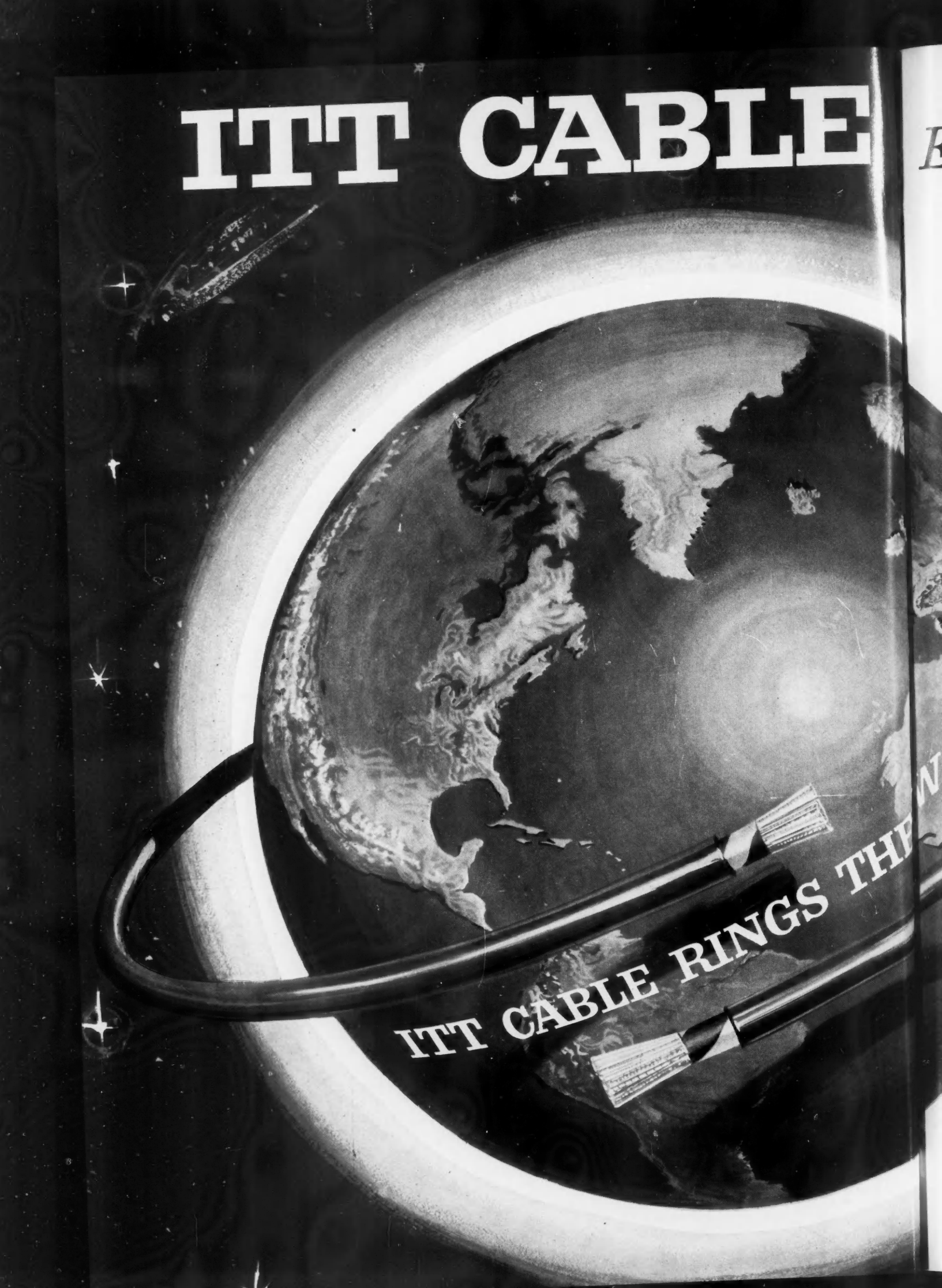
Percent-make and Dial Speed

AS HE TALKED, the Kid had hooked up a telephone instrument to the pulse meter, removed the handset and pulled "0" on the dial. The pulse meter indicated a dial speed of 9.6 pulses per second. He flipped the switch to "percent make" and again pulled "0." The meter indicated 42%-make. The Kid marked the figures on a small tag and attached it to the instruments base.

Despite his irritation, Jim felt his interest rise in something that he hadn't thought about for a long time.

"These are brand new telephones, aren't they, Kid?"

"Yep, Jim, warehouse sent them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Conductor: pure copper wire				
Conductor Resistance max. ohms/mile @ 20° C	230	145	92	46
Mutual Capacitance 900 cycles A.C., mfd/mile, max.	0.080	0.080	0.090	0.084
Capacitance Unbalance 900 cycles A.C., micro-microfarads	*	*	at 22 AWG: up to 1000′—100; 1001′ to 2000′—150; 2001′ and longer—200 at 19 AWG: up to 1000′—100; 1001′ to 2000′—150; 2001′ and longer—200	
Dielectric Strength: 60 cycles A.C., for 2 sec., volts rms				
conductor-to- conductor-to- sheath	355	355	355	500
core-to- sheath	850	1000	1000	1000

Insulation Resistance: not less than 1,000 megohm-miles at 60°F measured with a D.C. potential of 100 to 550 volts.

*not required, except if adjacent pairs are found with like lengths of twist when the 900 cycle A.C. capacitance unbalance shall not exceed 400 micro-microfarads.

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† *Major inventories are maintained at four strategic warehouses in New York, Chicago, Kansas City (Kan.), and Burlingame, Calif., to guarantee ready access and prompt delivery.*

up in their original cartons — I had to break them out."

"What are you finding in respect to dial performance?"

"It's a funny thing, Jim, most of them check out fairly good, but I found one that was only pulsing at 6 pulses a second, and another one was off on percent-make — around 55%."

"Well, the boys at Instrument Repair will readjust the governors or the make-springs to bring those two up to snuff. I guess they have found that it pays off to test the instruments, even though they are brand new, before actually putting them out into service. It's certainly a lot cheaper to run this test now than to make a repeat service call, later on, to take care of a faulty dial."

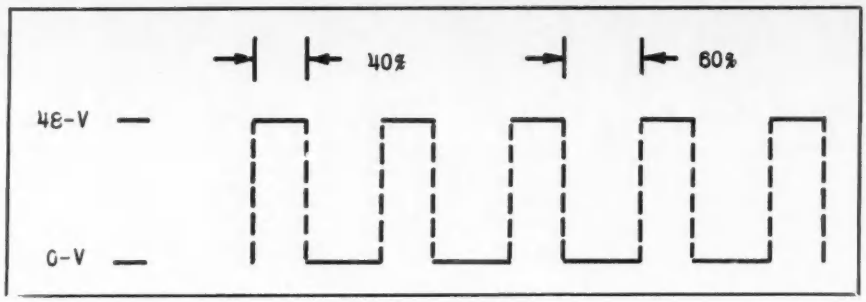


FIGURE ONE.

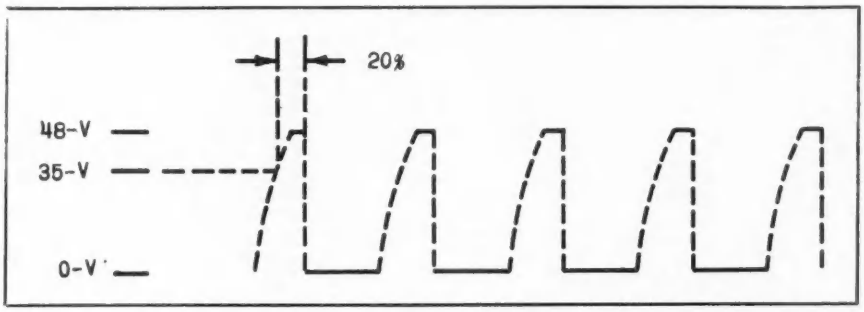


FIGURE TWO.

The Kid Is Bothered

THE KID continued testing the instruments but spoke while he worked: — "Jim, something bothers me about all this and I asked Chuck about it but he left for his coffee break without giving me an answer."

"What's that, Kid?"

"Well, we normally adjust the dials on our telephone instruments for a speed of 10 pulses per second and for a 38%-make. I was over at the test board the other day, sort of listening, while they checked on some cases of subscriber trouble. I noticed that part of the checks which the test board makes, before the service men leave, is to test dial speed and percent-make from the subscriber's premise in to our test board.

"The thing that bothers me is that I noticed that most of the dials checked out pretty close to 10 pulses per second, but percent-make was much lower than 38%. In one of the cases of trouble, the dial speed checked at 9.8 pulses per second but only 21%-make. This happened to be on an instrument that had a case of switch-hook trouble and Larry and Johnny replaced the telephone instrument.

"I asked Instrument Repair to send that particular handset up here so I could check out the dial, myself. I checked it about 15 minutes ago and the dial checks out at 9.8 pulses per second, but the percent-make is 38%, right on the button. Why is it OK here on the test bench but way down in percent-make when we get it out in the subscriber's premise?"

Jim perked up considerably. He always felt encouraged when he had youngsters who were interested enough in their work to ask questions concerning the "why" of various problems.

"First, Kid, let's go into some fundamentals. What actually happens when a subscriber turns his dial?"

"Well, the pulse springs of the dial open and close as they are operated by the cam."

"That's true, but what happens *electrically* on the circuit?"

"Oh, the circuit is opened and closed as the pulse springs open and close."

"Right! Now, since we are feeding out 48-volt plant battery, what is happening?"

"As I see it, Jim, all we are doing is interrupting dc at the rate of the dial speed."

"Okay so far, Kid! Now, what about the electrical characteristics of the circuits over which we are sending the interrupted dc? What about the characteristics of the cable, for instance?"

"Jim, since it is just dc that we are sending in to the central office I don't see where the characteristics of the cable will have any effect except for the dc resistance of the circuit involved."

"Whoa up a bit, Kid! The point where you are way off is when you start talking about it as 'just interrupted dc.' As soon as you start sending pulses of interrupted direct current, you start getting into something that is entirely different than a straightforward dc circuit. What we hope to send are little pulses looking like square waves whose peaks are equal to 48 volts and with troughs at the zero voltage level. The ideal would look something like this." (*See Figure One.*)

"In order to reproduce a wave of this shape, we actually must combine thousands of different sine waves, comprised of the fundamental frequency plus the harmonics, in order to have them add up to a pulse. Many years ago, a French mathematician named Fourier proved that any wave shape can be broken down into its component parts and that its basic equation was this:

$\epsilon = K_1 \sin \omega t + K_2 \sin 2\omega t + K_3 \sin 3\omega t + \ldots\ldots K_N \sin 4/\omega t$

"In this case, ϵ is our resultant series of pulses, the K represents the amplitude of each particular sine wave, and t is the period of time

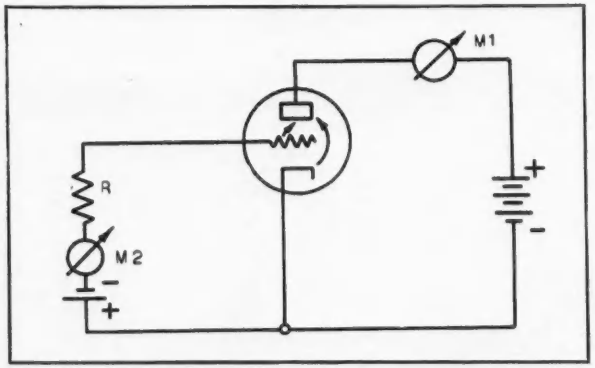
Please turn to page 58

TELEPHONE ENGINEER & MANAGEMENT's

ELECTRONICS NOTEBOOK

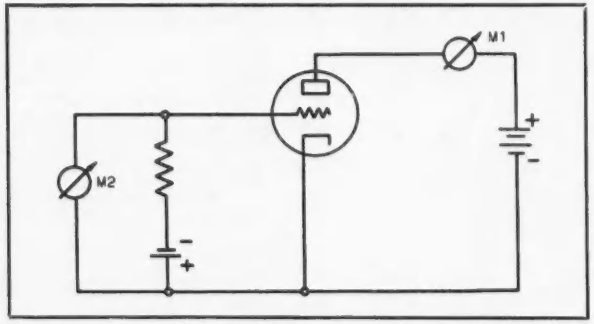
By LEO G. SANDS

The meter M1 indicates plate current and M2 indicates grid current, which should not exist since the grid is negative. However, if R is of high value and grid emission exists, current will flow from the



grid to the plate and there will be grid current.

To test for grid emission, a very sensitive tester is required. In this circuit, if the tube is OK, the



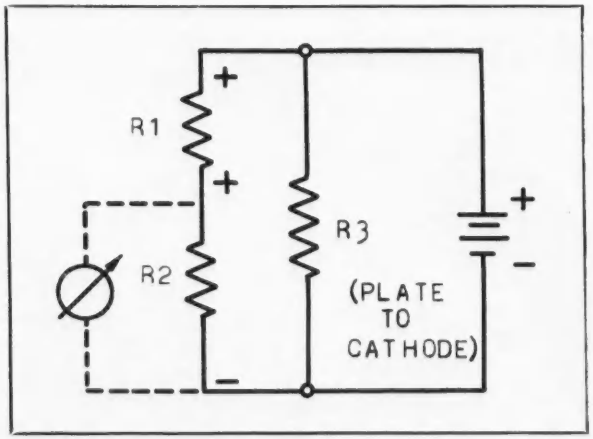
TELEPHONE ENGINEER & MANAGEMENT's

ELECTRONICS NOTEBOOK

By LEO G. SANDS

vacuum tube voltmeter will indicate a negative voltage, the same as the bias voltage supplied by C.

If, however, grid emission exists and grid current flows, a positive voltage will be indicated since the equivalent circuit will look like this. The drop across



grid and plate will look like R1 if grid current flows and the drop across R2, the grid resistor, due to this flow, can be measured with a very sensitive voltmeter.

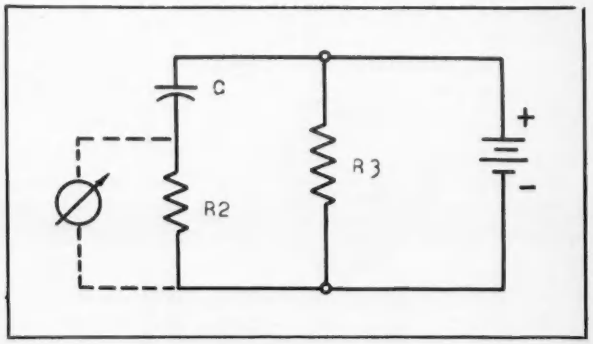
If grid emission does not exist, the equivalent circuit should look like this, with C representing the grid to plate capacitance, through which a-c, but not d-c, can flow.

Commercial grid emission testers use an electron eye tube in lieu of a vacuum tube voltmeter because it costs less and is just as effective as an indicator.

TELEPHONE ENGINEER & MANAGEMENT's

ELECTRONICS NOTEBOOK

By LEO G. SANDS



3.7-5 INTERELEMENT LEAKAGE

A short test shows up low resistance circuits between tube elements, whereas a sensitive leakage tester shows up high resistance leakage between tube elements. Theoretically, this is done by measuring current flow between tube electrodes in opposition to electron flow. In practice, a grid error tester, such as the one shown here, also tests for interelement leakage which upsets normally open circuits, as far as d-c is concerned.

The "Electronics Notebook" is a regular feature of each issue of "Telephone Engineer & Management." We urge all readers to read and file these informative 'Spec' book sheets for future reference.

More Data For Your "Electronics Notebook" In the Next Issue.

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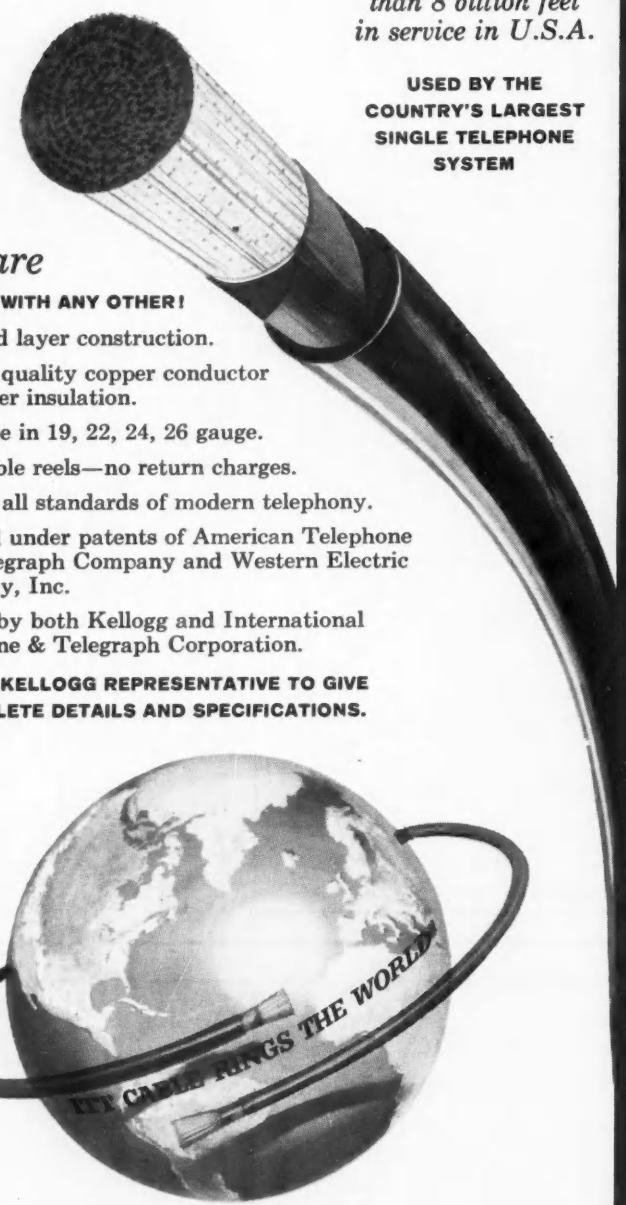

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ITT CABLE WITH ANY OTHER!

- Unit and layer construction.
- Highest quality copper conductor and paper insulation.
- Available in 19, 22, 24, 26 gauge.
- Disposable reels—no return charges.
- Exceeds all standards of modern telephony.
- Licensed under patents of American Telephone and Telegraph Company and Western Electric Company, Inc.
- Backed by both Kellogg and International Telephone & Telegraph Corporation.

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CHICAGO, ILLINOIS

Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue, Chicago 38, Ill. Communications division of International Telephone and Telegraph Corporation.

For complete list of offices, see pages 26-27

for one cycle. In the case of dial pulses at 10 pps, t would be 1/10 of a second. What I'm trying to show you, Kid, is that instead of just simple dc, dial pulses are actually the additions, or accumulation, of thousands of frequencies which, when added together, represent the actual pulse. Now, what do you say about the effect of the electrical characteristics of our circuits?"

The Kid scratched his head, "Well, Jim, this much I know — the more the capacity the lower the impedance that is presented to the high frequencies and vice versa as far as inductance is concerned."

"OK, Kid, I'll have to cut this short. As you know, our cables present high loss to the high frequencies but pass the audio frequencies in pretty fair shape. Now, when a square wave or a pulse is run through a circuit that has high frequency attenuation, its leading edge is chopped off." (*See Figure Two.*)

"This give you any ideas about percent-make from a subscriber dial?"

The Kid took a quick look, "I sure do get it now, Jim. If, for instance, a relay required 35 volts before it operated and the pulse is only 50% as wide as it should be at the 35 volt level, we would only get 50% of the make condition that the dial originally gave us."

"Exactly right, Kid — that is exactly what happens and it is the reason that our central office equipment has to actually operate under such a wide variety of tolerances."

Jim hurried back toward his desk and left the Kid scratching his head. — *C. D. Ehinger.*

Any comments, criticisms, or a suggested subject as a future topic? Address all correspondence to "Sub-Harmonics and Overtones," Telephone Engineer & Management, 7720 Sheridan Road, Chicago 26, Ill.

SUBMIT YOUR PROBLEMS

You are invited . . . to tell TE&M authors your problems of department policy or procedure on which you'd like to have an opinion.

PLANT NOTES ON NEW DEVELOPMENTS

by JOHN S. REED

New Earphone Shuts Out Noise

In this issue Mr. Reed discusses (1) an experimental electronic earphone; (2) tips for getting longer life from manila rope; (3) new power cutting tools; (4) new detector for locating air leaks in cable; and (5) a new wiring clip.

Electronic Earphone Shuts Out Loud Noises

AN EXPERIMENTAL electronic earphone has been developed to create artificial quiet by shutting out external loud noises that interfere with conversations.

It is the product of joint efforts of the U. S. Army Signal Research and Development Laboratory, Fort Monmouth, New Jersey, and Radio Corporation of America engineers in Camden, New Jersey. Earphones of this type are expected to find wide use in tanks and Army planes, where noise is a major problem.

Artificial quiet was obtained by adding more noise with a miniature microphone in a special earpiece to create a second noise — just as loud, but opposite in phase. When the two sound waves meet in the earcup, they use up almost all their energy bucking each other, thereby greatly reducing the noise level. As a result a loud roar is muffled to a whisper.

JOHN S. REED, TE&M's technical editor, is plant methods supervisor, Lincoln (Neb.) Telephone & Telegraph Co.

New experimental Army earphones can turn an ear-splitting roar to a whisper electronically. The tiny circular microphone (lower disc) in the earpiece picks up noise that leaks through ear cushioning. It then produces a second noise, opposite in phase to the first, which in great measure cancels the first to produce relative quiet. Conversations, however, come through loud and clear.

The earphones, first of their kind, are expected to have many commercial as well as military uses. For instance, they could be worn by riveters and mill workers to whom the roar of machinery is not only a nuisance, but sometimes a menace.

In combat, the earphones might be used by artillerymen to protect their eardrums and improve communications or could increase the efficiency of sonar operators by eliminating distracting noises. They might also quiet high noise levels for jet bombers and ground maintenance crews.

The earpieces work in conjunction with a special electronic inverter and amplifier unit that could be made small enough to fit into a soldier's pocket. The electronic system cuts low pitched sounds down to as little as 1/10th their original volume. Higher pitched sounds are trapped by special foam cushioning.

Getting Useful Life From Manila Rope

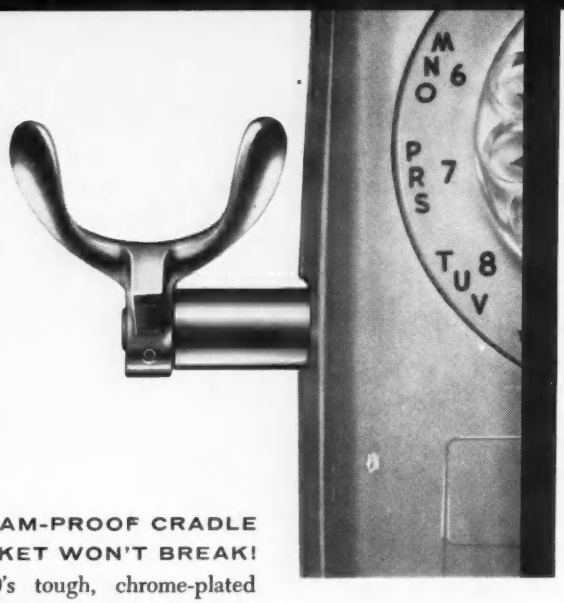
IN SPITE of the growing use of mechanized equipment in telephone maintenance and construction, there is still plenty of use for manila rope in this work. Since rope is perishable under certain conditions and yet has to be depended upon to support loads with safety to the workers, it needs proper use and good care.

In obtaining manila rope, care must be taken to purchase the genuine article, which is manila hemp imported from the Philippines. This manila hemp makes the best rope. Sisal, a harsher and less pliable fiber from a different source, has only 75 percent of the strength of manila fiber. Sisal fiber rope looks and feels much like manila rope after use has made it softer and more pliable. In fact, there is danger that sisal rope may be inadvertently used for the regular article on jobs for which it has insufficient strength.

Men who use rope frequently for pulling, holding, and lifting operations are familiar with the various kinds of knots that are employed to tie rope to objects. What is probably less known is the strength of the knots which is always less than the strength of the rope itself as the list below indicates:

Type of Knot	Percent of Safe Working Strength of Rope
Clove hitch	75%
Bowline (outside)	50%
Bowline (inside)	53%
Square knot	43%
Timber and half hitch	72%
Sheepshank	35%
Eye splice	85%
Short splice	85%
Long splice	68%

Incidentally, good information on various rope knots is contained in



SLAM-PROOF CRADLE BRACKET WON'T BREAK! Type 90's tough, chrome-plated cradle is securely fitted to a sturdy shaft that turns in a long bearing-bracket. It's more than a match for the handset-slamming subscriber!

INSTALLATION AN MAINTENANCE AR A SNA

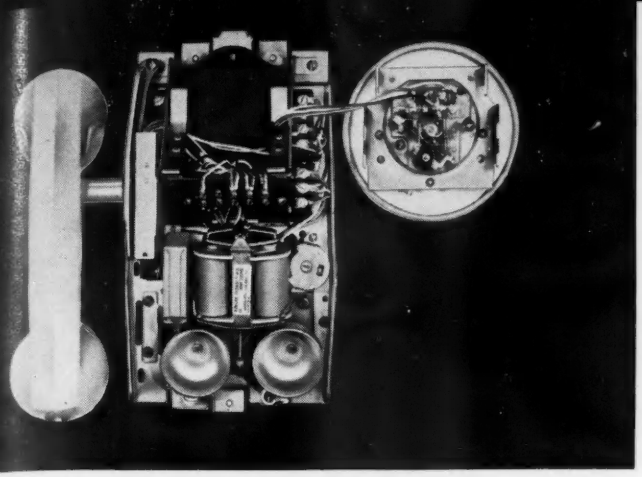
Loosen one screw, the cover lifts and you fasten Type 90 to the wa (handset stays in the cradle). Th loop compensator is adjusted fro the front. To remove the dial, jus push and lift. And, you can remov the ringer from the front – witho taking the phone off the wall.

TYPE 90 is

HANDSET CAN HANG BEHIND THE CRADLE when it is necessary to leave the telephone. This keeps the handset from dangling down the wall and scratching the finish.

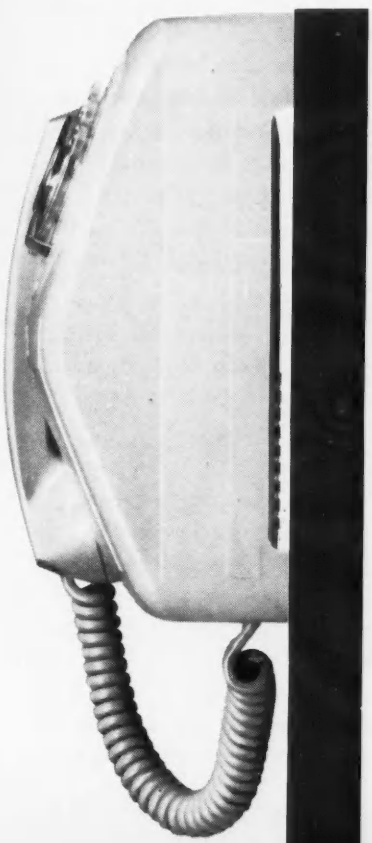
SMART, FUNCTIONAL DESIGN – really pleases the ladies! There are 10 decorator colors to choose from. Type 90 fits into the color scheme of any home.

Side-
out in
specia
bers
stand



0 is better than any other wall phone happens to be!

SHALLOW PROFILE!
Side-mounted handset doesn't stick out into the room. And, Type 90's special dial angle makes the numbers easier to read whether you stand or sit.



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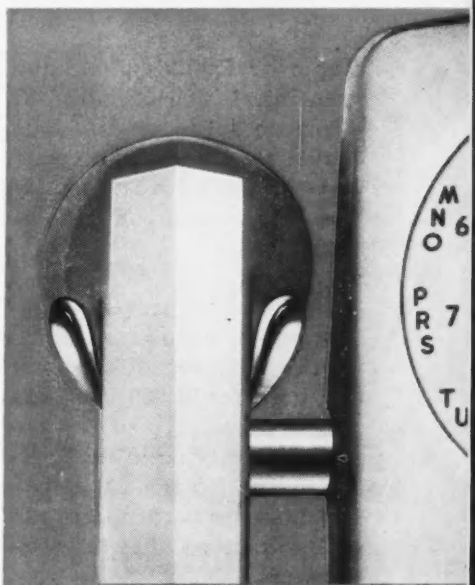

WRAP-AROUND CRADLE HOLDS HANDSET SECURELY!
Type 90's handset can't be dragged, brushed or knocked off the hook. This keeps "off-hook" trouble calls down.

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Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

"Super-Splice" ®
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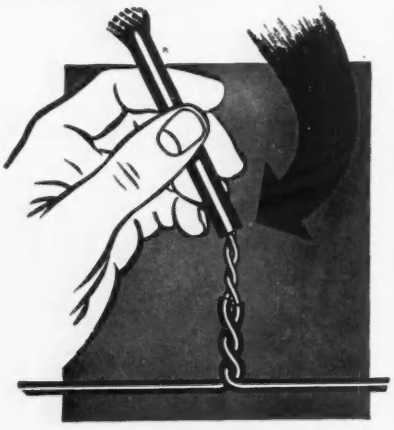
waterproof
... from
inside out!

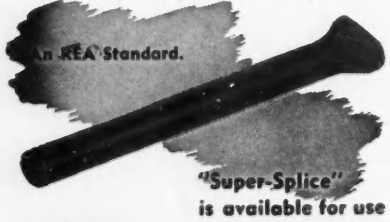


Superior Cable's exclusive economical "Super-Splice" is a plastic splice sleeve. It is sealed at one end and comes to you filled with an insulating and waterproofing compound.*

"Super-Splice" prevents leakage currents and breakdowns in the presence of moisture . . . good for 25,000 v. d. c.

Can be easily removed to reenter the splice . . . the compound never hardens or oozes out no matter what the temperature.

*A Dow-Corning silicone compound.



"Super-Splice" is available for use with straight, butt or bridge splices.

For further information on economical "SUPER-SPLICE", write

SUPERIOR CABLE
SUPERIOR CABLE CORPORATION
Hickory, North Carolina

a bulletin entitled "Care and Use of Rope on the Farm." It is obtainable from the Superintendent of Documents, Washington 25, D. C. as U. S. Department of Agriculture Farmers' Bulletin No. 1931.

The following practical suggestions will assure a long, useful life for manila ropes and provide safety for men using these ropes.

(1) When uncoiling rope, lay the coil flat on the floor with the inside rope end at the bottom of the coil. Pull the end of the rope up through the center of the coil. Unwind right-laid rope in a counterclockwise direction and left-laid rope in a clockwise direction.

(2) Store rope in a cool, dry building or in a well-ventilated room. Loop the rope in loose coils on wooden grating off the floor or hang it on wooden pegs. Storage in a confined, unventilated space causes dry rot, while continued exposure to sunlight damages the rope fibers.

(3) If the rope gets wet, it should be thoroughly dried to avoid premature loss of its strength.

(4) The rope should be kept clean. If it gets dirty, it should be washed in clean water, being sure to dry it thoroughly before putting it away.

(5) The rope should not be allowed to come in contact with chemicals or fumes since this will damage the rope fibers. Such deletrious substances are storage battery acids, linseed oil, paint, and washing compounds.

(6) The rope must not be kinked. If the kinked part is pulled through a tackle block or restricted place, this will cut the fibers and weaken the rope.

(7) A safety factor of five should be used when selecting the proper size of rope for a job. The safety factor is obtained by dividing the minimum breaking strength (from the rope manufacturer's tables) by the applied load. Allowance should be made for the condition of the rope and its intended application (sling, block and tackle, and the like) when applying the safety factor. Overloading a rope is not only poor rope conservation, but also is dangerous to the workers.

(8) Ropes used as guy lines that are exposed to weather should be loosened. This will prevent excessive strain from shrinking the ropes.

(9) Rope should not be run or placed around corners or edges as this will cut or break the outer fibers.

(10) Use the correct size of sheave for the rope diameter as obtained from the rope manufacturer's tables. Sheaves that are too small increase wear on ropes and produce too much friction in lifting loads.

(11) From time to time ropes should be reversed, end for end, so that all sections will receive equal wear, particularly when they are used in tackle blocks. Should a rope be damaged, the damaged portion should be cut out and the rope replaced.

(12) Rope should not be lubricated. Good rope is adequately and permanently lubricated by the manufacturer.

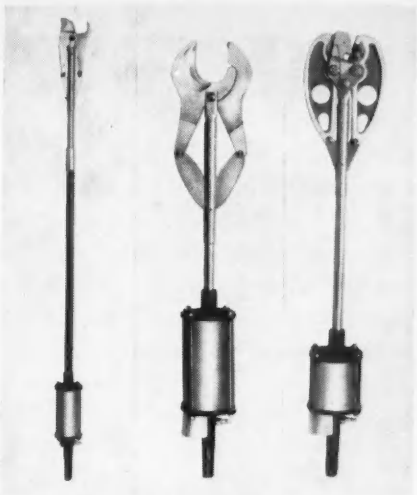
(13) Ropes should not be chafed or dragged over sharp edges or rough surfaces, as this will damage the fibers and shorten the rope life. Rope dragged over the ground will pick up sand and other abrasive particles which work into the rope to cut and damage the inner fibers. When rope has to be run over cleats and winchheads, the surface of these objects should be smooth.

(14) The proper splicing of rope will prolong its life. Splices are better and stronger than knots for permanent connection. Knots reduce the strength of the rope as much as 50 percent.

New Types of Power Cutting Tools

POWER operated tools considerably reduce fatigue for linemen and save much time in work operations, particularly when repeated operations are involved.

Three new cutting tools have recently been added to the growing list of power tools available to the telephone industry. See illustrations on page 63. The communications cable cutter severs lead- and plastic-sheath cable up to 3¼ inches in diameter. The guy strand cutter cuts through steel strand up to ½ inch in diameter. The power pruner lops green



Powered types of cutters. Left — power pruner. Center — communications cable cutter. Right — guy strand cutter. (A. B. Chance Company)

branches up to 2 inches in diameter. A light thumb pressure on the trigger of the power cutters is sufficient to activate their powerful cutting jaws, and the cut is made with a single quick stroke.

These tools make a clean cut, leaving severed ends smooth, neat and even. When the trigger is released, the jaws open automatically, ready for the next cut.

No experience or skill is required to operate the tools. They are said to be perfectly safe, provided that normal safety precautions are observed. Being simple in design, light in weight, and well balanced, they are easy to use. Ruggedly constructed for troublefree service, these tools have hardened-and-tempered alloy-steel jaw blades and strong, lightweight aluminum bodies. The blades can be quickly removed and replaced without special tools.

Power sources for these pneumatic tools are readily available. They can be operated from standard cylinders of dry nitrogen, compressors, or factory air lines. Air hose and tool bags are available separately.

New Air-Push Leak Detector Locates Air Leaks In Cable

LEAKS IN pressurized cable are said to be easily and quickly located with the Air-Push Leak Detector illustrated. The bottle cap is equipped with a dauber for wiping the joint or area on cable. It is claimed that bubbles will form in just

New Air-Push Leak Detector manufactured by Sprague Devises, Inc., easily finds pressurized cable leaks in just five seconds.

5 seconds if there is a leak in the location covered with the solution.

The solution is said to be convenient, easy to use, and requires no mixing. It is applied as clear liquid with no confusing suds. The liquid is available in 4 oz. bottle with dauber cap, also in pint bottles and gallon

Using powered cutters. Left — lopping tree branches in cable lead with power pruner. Center — severing dead telephone cable for removal. (Rest of the cable may be cut up in pieces with this tool on the ground if the cable is to be junked.) Right — cutting guy or messenger strand with power strand cutter.

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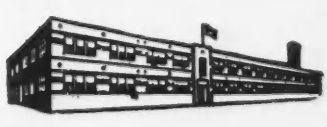


TELEPHONE ENGINEER & MANAGEMENT'S

PLANT MAN'S 'SPEC' BOOK

(4) Cable Pressurization Procedures — Refrigeration Type Air Dryers

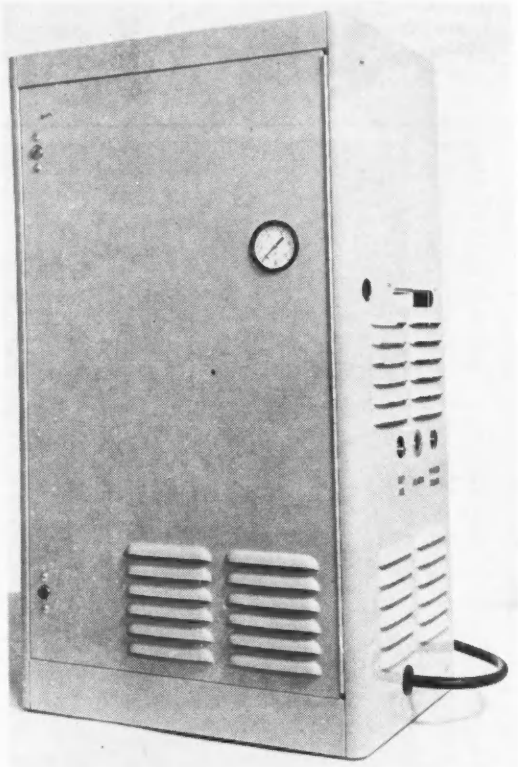


FIGURE ONE: — Puregas Equipment Corp. Model 750 Air Dryer with maximum capacity of 750 standard cubic feet of dry air per day.

TELEPHONE ENGINEER & MANAGEMENT'S

PLANT MAN'S 'SPEC' BOOK

(5) Cable Pressurization Procedures — Refrigeration Type Air Dryer

	Model 750 Unit	Model 1500 Unit	Model 5000 Unit
Weight	275 Lbs.	315 Lbs.	885 Lbs.
Capacity	750	1500	5000
	Standard cubic feet of dry air per day.		
Minimum Operating Temperature	35°F	35°F	35°F
Maximum Operating Temperature	120°F	120°F	120°F
Delivered Air Humidity	under 2% at 70° F		
Delivered Air Pressure	0 to 15 psig adjustable		
Components used in these three models are listed below;			
Air Compressor Motor	General Electric heavy duty for continuous operation on Model 750 and Model 1500. General Electric Tri-Clad heavy duty motor with permanently lubricated bearings on the Model 5000.		
Air Compressor	Quincy with roller bearings and special oil rings on Model 750. Quincy two-stage with roller bearings and pressure lubrication on the Model 1500 and Model 5000.		
Air Storage Tank	Stainless steel, complying with ASME and all state codes on all three models.		
Refrigeration System	Tecumseh hermetic type, similar to those used on domestic refrigerators with 5 year warranty.		
Humidity Alarm	American Instrument fail safe type.		

TELEPHONE ENGINEER & MANAGEMENT'S

PLANT MAN'S 'SPEC' BOOK

(6) Cable Pressurization Procedures — Refrigeration Type Air Dryers

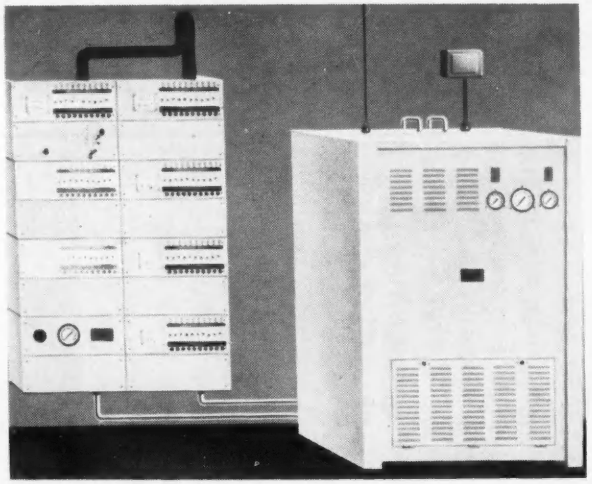


FIGURE TWO: — Model 5000 Air Dryer with capacity of 5000 standard cubic feet per day (or 7000 cubic feet per day for a two week period).

Figure Three indicates the location of the components in the Model 750 Air Dryer.

The Model 1500 and Model 5000 Units are equipped with an automatic water drain as standard equipment. The Model 750 Unit has a condensate storage tank that requires periodic draining. This unit can be supplied with an automatic water drain at a nominal extra charge.

A periodic check of the compressor oil level is the only regular maintenance operation required on these air dryer units.

More Data For Your "Spec Book" on Page 70.

containers and is said to last indefinitely.

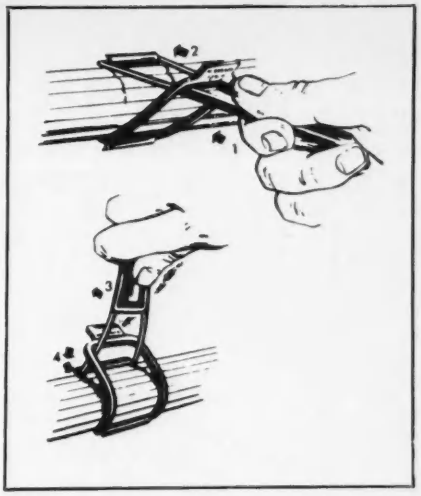
New Wiring Clip Saves Time

MUCH USE is made of lacing cord in holding together wire runs and harnesses in central offices and PBX systems. The operation of lacing the wire runs to hold the wires together consumes much time in the initial installation. Should it ever be necessary to add or replace a wire anywhere in the run, more time is lost in removing the lacing, adding the wire and replacing the cord tie.

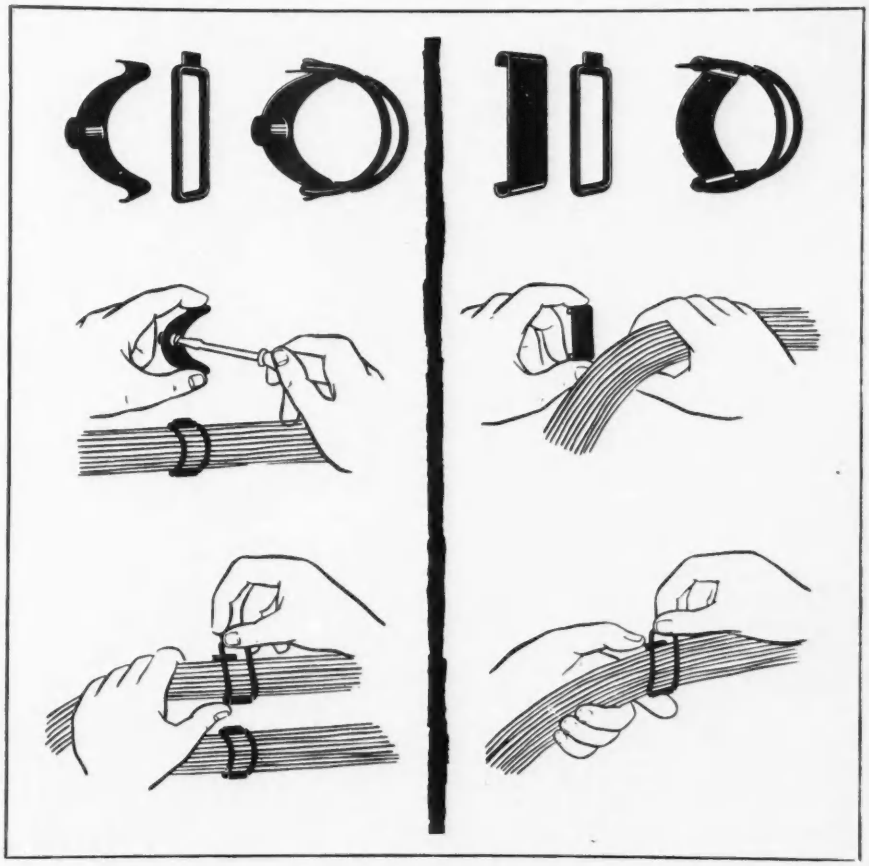
Clamps and clips have been used in place of the lacing. A new type of clip has been developed which is stated to cut wiring costs by as much as 52 per cent when used in wiring systems.

The Insuloid Cradleclip wiring system has been designed to reduce wiring time wherever electrical wiring is required. It is said to be foolproof in application and completely safe and permanent in operation. The system consists of binders and endless extensible clips for unsupported wiring and cradles and endless extensible clips for anchored wiring. Both the binders and cradles are moulded from tough Nylon and are virtually unbreakable. The extensible clips are moulded Neoprene which combines the right degree of toughness with the necessary flexibility to hold any type of cables securely without damaging them. These binders and clips can be used over

Please turn to page 68



Insuloid cradle clip wiring system using cradles, binders, and extensible clips.



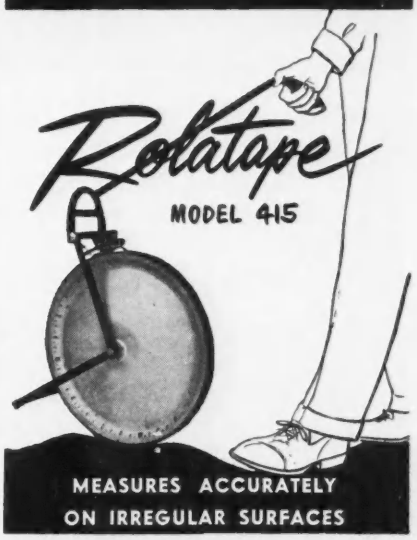
Left — Method of supporting wiring in cradle for attaching to surface. After cradle is screwed in place, ring is placed in the cradle and an extension clip is hooked on as shown. Right — Method of binding unsupported wiring.

It's New!

NOW–AT LAST A MEASURING WHEEL THAT MEASURES ACCURATELY TO A FRACTION OF AN INCH!

Rolatape's amazing new Model 415 meets all your measuring needs — measuring quickly and surely over the most uneven and irregular terrain with no risk of human error. This time-saving instrument is calibrated to measure accurately in full view of operator as it is rolled along, giving measurements in inches (to ½ inch) on one side of measuring wheel, and tenths of a foot (to .5 of a foot) on the other. Sturdy and lightwight, it is equipped with automatic brake and built-in stand. Handle folds compactly. See one at your dealer's today.

Rolatape MODEL 415



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More Data For Your "Spec Book" on Page 70.

WESTERN ELECTRIC AND

SKILLED HANDS prepare giant frames of complex central office dial switching equipment slated for installation in one of the many Bell telephone companies across the nation. This equipment and telephone cable are the principal products Western Electric makes in Chicago.

CHICAGO, ILL.

Nation's leader in grain trading, meat packing and rail handling, Chicago is the leading maker of Bell telephone equipment, too... at Western Electric's Hawthorne Works. And Chicago shares in the benefits this telephone job provides.

Chicago sprouted from a small Lake Michigan settlement into a vigorous metropolis in just over a century. And Western Electric grew with it, for it was 90 years ago that our newly formed company first came to Chicago.

Western Electric feels itself an integral part of this great city for over 21,000 Chicagoans help us with our job as manufacturing and supply unit of the Bell System.

Many other thousands also help as employees of our Chicago suppliers. Last year we spent almost 63 million dollars with 2,696 Chicago companies – part of our statewide supplier team of 3,719 firms.

As important as the telephone equipment we make are the benefits our work provides. These include the added business to local merchants, taxes that aid city betterment, and the active participation our people have long taken in civic and social activities.

Western Electric is happy indeed to have shared in Chicago's rapid progress and we look forward to a prosperous future together.

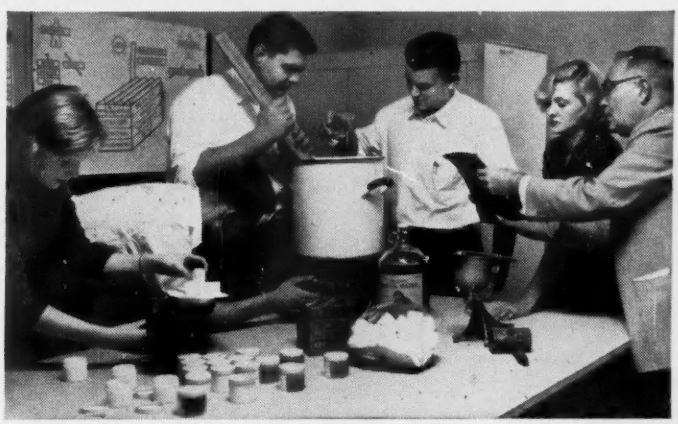
Besides Chicago, Western Electric has plants in 25 other cities where we also make telephone equipment for the Bell System. Last year we purchased over a billion dollars' worth of raw materials, products and services from over 30,000 suppliers located in every state. Of these, 90% are "small businesses." The things we make and buy are distributed to the Bell telephone companies through Western Electric distribution centers in 32 different cities.

Western Electric

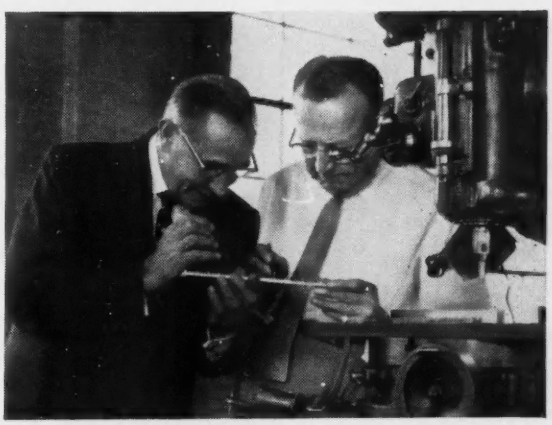
MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

PERISCOPE PEERING is the high point of a visit to the Chicago Museum of Science and Industry. Western Electric's Arthur Wiseman, Jr., and family find Chicago full of delightful sights and surprises including the captured German submarine (U-505).

HIGH PRAISE from Paul W. Goodrich, President of the Chicago Association of Commerce and Industry: "Western Electric's Hawthorne Works has always been considered one of Chicago's finest industrial neighbors – a highly cooperative corporate citizen."



JUNIOR ACHIEVEMENT group of teenagers sponsored by Western Electric is supervised by W. E. employee, Herb Preppernau, as they manufacture hand cream with a lanolin base. Many of our Hawthorne Works employees devote a lot of their spare time to such worthwhile community projects and activities.

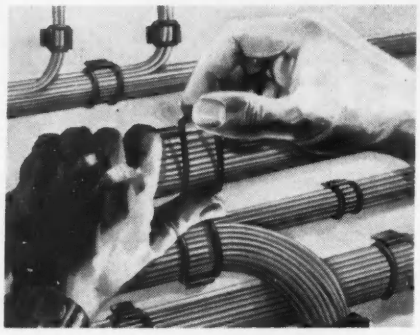


MUTUAL INSPECTION of a Western Electric part is conducted by W. E. purchasing man, S. Jenson (left), and F. Corte, President of Boyar-Schultz Company. Boyar-Schultz specializes in repairing tools and dies and is one of our 2,696 Chicago-area suppliers.

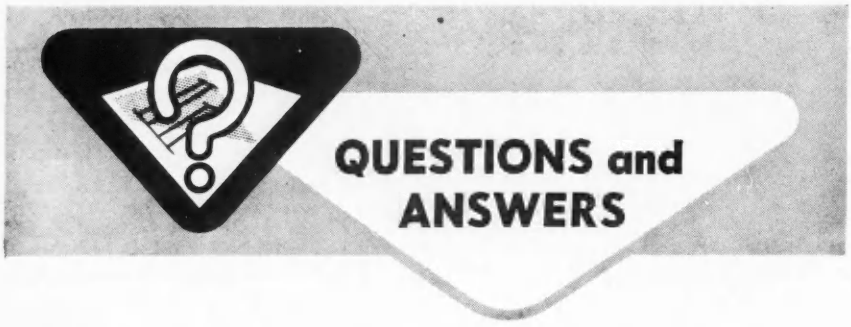
a range of approximately —76° F to +212° F.

The advantages claimed for the use of these clips are savings in assembly time, faster wiring changes, reduction in the amount of wire used in harnesses, neatness of appearance of wiring and greater air circulation as the harness (wire run) is raised off the surface, an important factor when battery or power wiring is included in the harness.

The binders can be easily applied over the wiring onto the cradles with the fingers. For production work a hooker is available.



Method of using hooker in production work. (1) Insert tool through center of clip. (2) Secure it to lip of cradle or binder. (3) Snap clip over lip of cradle or binder by turning the hooks around wire or cable bundle. (4) Slip off the tool.



QUESTION: — *In regard to the use of plastics in conductor insulation and wire or cable jackets, what is meant by a plasticizer and what is its purpose?*

ANSWER: — Plasticizers are needed in vinyl plastic to make this material softer and more flexible, particularly at low temperatures which cause cracking of the untreated plastic. Examples of effective plasticizers are dioctyl phthalate and n-octyl, n-decyl phthalate, which do not affect the long service life of the vinyl plastic.

QUESTION: — *Please explain how resistance design is applied to cable. Why is it used and what are its advantages?*

ANSWER: — Resistance design is intended to do away with complicated calculations required to determine loop losses in exchange circuits. When modern, high-efficiency telephones are employed, the limiting factor is line resistance which in turn is limited by supervision and dial pulse distortion. This resistance is 1,000 to 1,200 ohms, depending on the type of central office equipment. Within the conductor resistance limits, the most economical combination of conductor gauges (wire and/or cable) is chosen for the circuits from the central office to the subscriber stations. Loading is employed only when required by the length of the subscriber loop and the total length of bridge cable pairs is limited to avoid introducing excessive capacitance into the circuits. It should be noted that the older, lower efficiency telephone sets can be used in the shorter subscriber loops to reduce the cost of changing over to the modern sets.

QUESTION: — *We are interested in the use of pole spraying methods to reduce shell rot to a minimum. What is the latest information on the procedure?*

ANSWER: — A cooperative investigation by the Forest Products Research Center, Forest Lands Research Center, and Bonneville Power Administration indicates that it is desirable to use a pentachlorophenol concentration of 10%, rather than the usual 5 to 6% solution to improve the protection. Fungi are not completely killed by the lower percentage solutions, though they are weakened. When fungi from untreated poles are tested in culture, they develop in 5 to 7 days, whereas fungi from treated poles require four to five times as long to develop. Slow fungi growth indicates that shell rot will be retarded in these poles. However, weathering causes loss of the solution from poles, which reduces the period of protection, and a higher concentration of pentachlorophenol appears to be desirable for extended protection. We suggest that you contact pole spraying companies for information on spraying programs suited to your locality.

QUESTION: — *Would there be any problem in locating faults in plastic jacketed telephone cable with plastic insulated conductors? Would the same fault location procedure be used as for lead-covered cable?*

ANSWER: — Essentially the same procedure would be employed for both types of cable. There is, however, a factor that may prove troublesome in locating wet shorts in plastic jacketed cable with plastic insulated conductors. When water gets inside a lead-covered cable, the moisture does not spread very far because the paper insulation swells and seals the spaces inside so the wet spot is confined to the location of the sheath break and it is easy to locate the sheath break by tests. In the case of the plastic jacketed cable, the insulation on the conductors does. Through a hole in the jacket it travels over a considerable distance before it finds a hairline crack or a pin hole in the insulation of a conductor. The fault in the conductor insulation can be located but it would be impossible to tell where the sheath hole is since the break may be as much as several hundred feet away.

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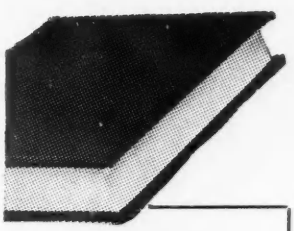

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The final portion of the book deals with the practical applications and operating methods in the electronics communication field, including broadcasting, television, shipboard radio, radio direction finding, radar and loran. In addition, the varied laws and regulations which govern radio communication are treated in considerable detail. Mathematical and problem-solving techniques are explained as the need for them arises in the book, and a helpful summary of basic communication laws and regulations are provided.

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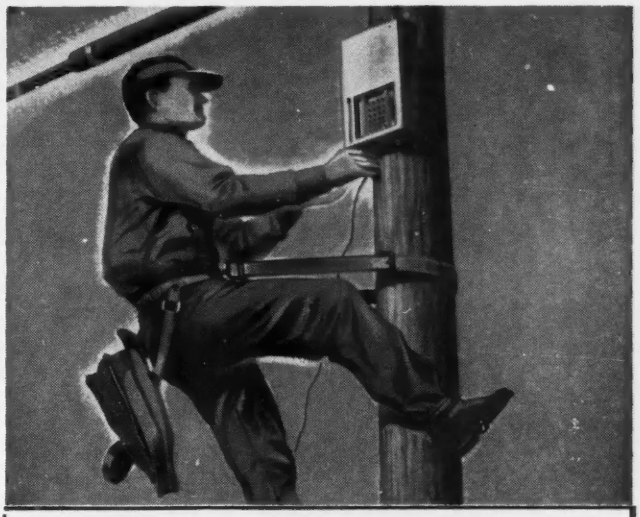

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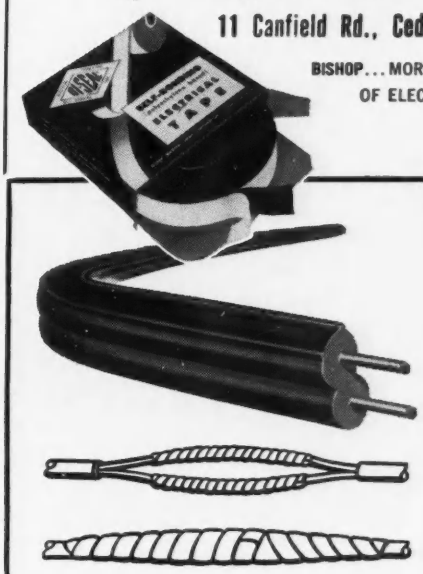

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PLANT MAN'S 'SPEC' BOOK

(7) Cable Pressurization Procedures — Refrigeration Type Air Dryer

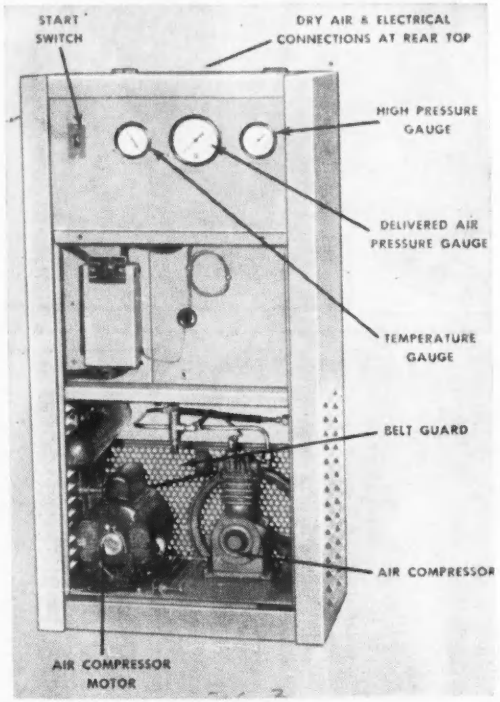

FIGURE THREE: — Interior view of Model 750 Air Dryer, showing components.

Operation of Air Circuit of Air Dryer

Ambient air is drawn in through a felt filter pad

TELEPHONE ENGINEER & MANAGEMENT'S

PLANT MAN'S 'SPEC' BOOK

(8) Cable Pressurization Procedures — Refrigeration Type Air Dryer

muffler and silencer in the compressor intake, then through the suction valve into the compressor cylinder. It is discharged under pressure through the exhaust valve.

An unloader pilot automatically unseats the suction valve of the compressor when the air supplied is greater than the demand. The pilot is set to unseat the suction valve at 150 psig and to seat it when the tank pressure falls to 135 psig. No air will be delivered by the compressor while the suction valve is unseated.

After the air leaves the exhaust valve it is carried to a stainless steel storage tank. The tank contains a refrigeration coil designed to cool the air and thus condense the water. The tank is insulated with plastic insulation which in turn is protected with a sheet metal housing. The water condensed from the air drains out through a bottom pipe to the automatic water ejector.

The compressed air leaves the storage tank through a porous bronze filter and flows into the pressure reducing valve. This is a single stage regulator capable of reducing the tank pressure of 150 psig to the pressure desired in the dry air system.

The low-pressure air then flows thru a low-pressure manifold to which is connected the high-low pressure alarm and the humidity sensing element which will close the alarm circuit if the humidity rises above approximately 10 percent relative humidity at 70° F. The high-low pressure and high humidity alarms are wired in parallel and in the event of malfunction will close the circuit of the

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PLANT MAN'S 'SPEC' BOOK

(9) Cable Pressurization Procedures — Refrigeration Type Air Dryers

alarm pair. Which kind of alarm is being given can be quickly determined by noting if the low pressure gauge is at its correct setting.

Refrigerant Circuit of Air Dryer

The refrigerant vapor, Freon-12, is compressed in the compressor, and then flows to the finned coil. The finned coil is cooled by the fan which operates only when the refrigerant compressor operates.

The Freon vapor condenses to a liquid in the finned coil or condenser. It then flows thru the very small (capillary) tube to the cooling coil in the storage tank. The capillary tube serves to meter the flow of refrigerant to the coil. In the cooling coil the refrigerant liquid evaporates, thus picking up heat from the compressed air. The vapor then returns to the compressor.

Operation of Alarm Circuits

A United Electric pressure switch is employed for the high-low pressure alarm. This unit employs two snap action single pole switches, is not sensitive to vibration and will give extreme repetitive accuracy. The unit requires only the initial adjustment on installation.

The humidity alarm is made up of an alarm box and a sensing element connected by a 300 ohm cable. The circuit consists of a humidity sensing element mounted in the dry air stream and an alarm box which combines the amplifier and relay. If at any time the relative humidity of the delivered air increases above approximately 10 percent at 70° F, the relay will operate and close the alarm circuit.

More Data For Your "Spec Book" In The Next Issue.

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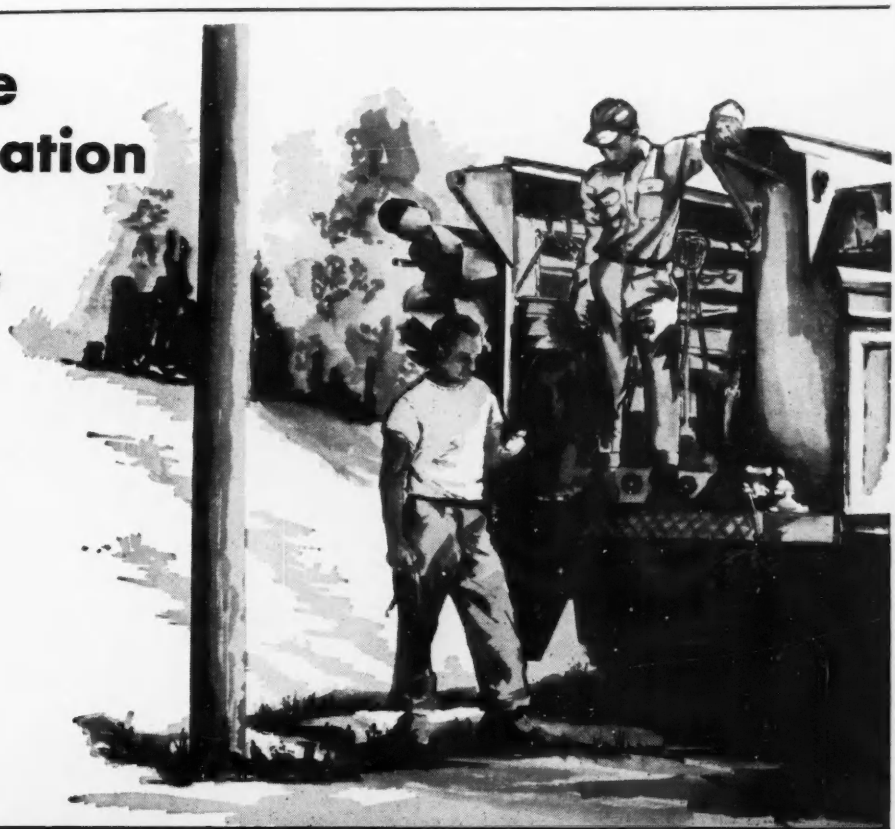

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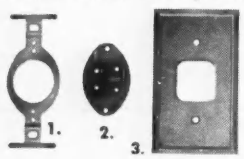
SE-63A Junction Box, 45c | SE-60 Mounting Ring* | SE-493A Oval Jack $1.30 | SE-16B Face Plate*

*SE-60 and SE-16B, 45c

Modern Plug and Jack Assembly

Latest telephone practice calls for use of the SE-63A (open) junction box, SE-60 mounting ring with oval SE-493A jack, and one of several types of the SE-16 series face plates. The SE-63A junction box screws into vertical wall studs (2"x 4" or other) and accepts the hardware assembly as above.

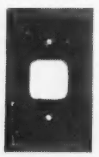


1. SE-43A Bracket 30c ea.
2. SE-493A Oval Jack $1.30 ea.
3. SE-19B Plate 28c ea.

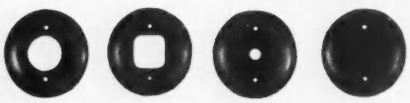
Modern flush outlet installation utilizing SE-19B standard face plate, SE-493A oval jack, and SE-43A bracket holed for standard conduit box.

Face Plates

45c each, including SE-60 mounting ring and screws.



SE-19B



SE-16A | SE-16B | SE-16C | SE-16D

Five styles of face plates are availaible. SE-16A takes SE-47C multiservice, 12-terminal connecting block; SE-16B takes SE-493A jack; SE-16C for permanent phone; SE-16D for undecided service; SE-19B accepts SE-493A with SE43A bracket, or, SE-404B jack with SE-44 bracket for flush mounting.

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W. J. HALL, president of WCHN, giving opening broadcast from Chenango & Unadilla Tel. Corp. fair booth. At left is ROBERT PANNICK, commercial manager, and on right, MRS. HAZEL SLATER, who was in charge of telephone exhibit which featured a "Lucky Dial Number" game.

Another "Fair" Idea

By ROBERT R. STRATTON
Chenango & Unadilla Tel. Corp.

THE SHARING of public relations, advertising, and sales promotion activities between telephone companies is of the greatest importance. With this thought in mind we would like to report on our latest adventure into these fields.

The better state and county fairs continue to draw record breaking attendances. Therefore, we again had a telephone equipment display at our local fair.

Close to 80,000 people visited our fair with a large percentage of this number passing or visiting our telephone equipment display.

Fully realizing that repetition in display of telephone equipment could kill our efforts we resorted to three gimmicks to add new interest.

The first gimmick was a game of "Lucky Dial Number." To set up the game, we used approximately 100 vacant telephone numbers. One of the numbers was the winner. The others were put on intercept and run to a telephone answering and recording unit. A special record was cut for this game. By dialing the winning number a contest participant actuated a Klaxon Horn, an extension gong and three yellow lights. When the horn blew, the bell rang and the lights flashed — and we had a somewhat startled winner. When one of the incorrect numbers was dialed the recorder was reached and it gave a short sales pitch and a "Sorry you have not reached the Lucky Dial Number."

Contestant playing "Lucky Dial Number" on special pink telephone labeled "Lucky Dial Telephone." Commercial representative waits in background for horn, bell and flashing lights to signal a winner.

Visitors to our booth drew Lucky Dial numbers from a glass jar. The numbers were put back into the jar and reused. For prizes we gave service connection charges which were charged to our advertising budget. In short we gave out installation charges on whatever the winners wanted such as colored telephones, extension telephones, change of equipment, etc. We feel that getting people to use our services is half the battle along the road to a final sale.

Each day we had a special winner during one of the rush hours. These winners were given clocks.

Visitors to our display saw work-

ing telephone equipment such as multi-line key telephones, dial-lighted telephones, hard-of-hearing telephones, secretarial answering units, colored telephones and hands-free telephones. Much interest was shown, especially from women.

Our second gimmick was having an artist drawing caricatures at our booth. We hired the artist for a flat fee and he charged 50¢ a pencil drawing. The slightly Bohemian atmosphere generated by this artist did much to attract crowds to watch him draw and to observe our display of equipment. We had many complimentary remarks about the artist at our booth.

For our third gimmick we had a 15-minute radio broadcast each day originating at our fair booth.

During these broadcasts the usefulness of telephone equipment was discussed and many interesting people were interviewed.

Our whole object was to make passers stop, stoppers look, and lookers buy telephone equipment. We feel that the unusual and interesting gimmick will do just that for you too.

One of our commercial representatives was at our display booth at all times to take orders for telephone service and answer questions. We signed several people for additional telephone service during the fair. We also feel that we interested many more people in extension telephones or other equipment — and that means new business in the near future.

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Automatic Meter Reading

(Concluded from page 46)

in use and, since the bell does not ring, the customer is not likely to be disturbed.

The meter hand at each dial always turns in a constant direction, and its motion must not be blocked by the contact on the wiper arm or any other part of the reading mechanism. Provision is made for the rotating meter hands to override the contact on the wiper arm without damage to either. As shown in the insert in *Figure Four*, the contact on wiper arm is provided with an insulating back plate (42″) attached to a spring (42″). As the contact on the meter hand in its normal progress approaches the wiper arm contact, it meets the insulated back which folds down out of the way due to the yielding of the spring, enabling the meter hand to pass by without activating or damaging the contacts.

On the other hand, when the contact on the wiper arm is seeking the meter hand, it overtakes it from the rear, and the instant the contact is made, the cocking solenoid pulls the rack back rotating the wiper arm in the reverse direction to its resting position. In this manner, the meter hand is not subjected to undue strain in any way.

The counting pulses coming in from the meters to the accounting station cause corresponding numbers at the punching machines to be set up for the punch card records (*Figure Five*). For each dial at the meter there is a corresponding 10 — tooth counting wheel at the punching recorder receiving machine. This wheel turns one tooth for each metering pulse sent to the station by the meter reading apparatus. The counting wheel operated by a solenoid plunger (61) pulls the ratchet teeth of the wheel one tooth whenever the release solenoid (62) receives a pulse from the contacts at the meter on the customer's premises.

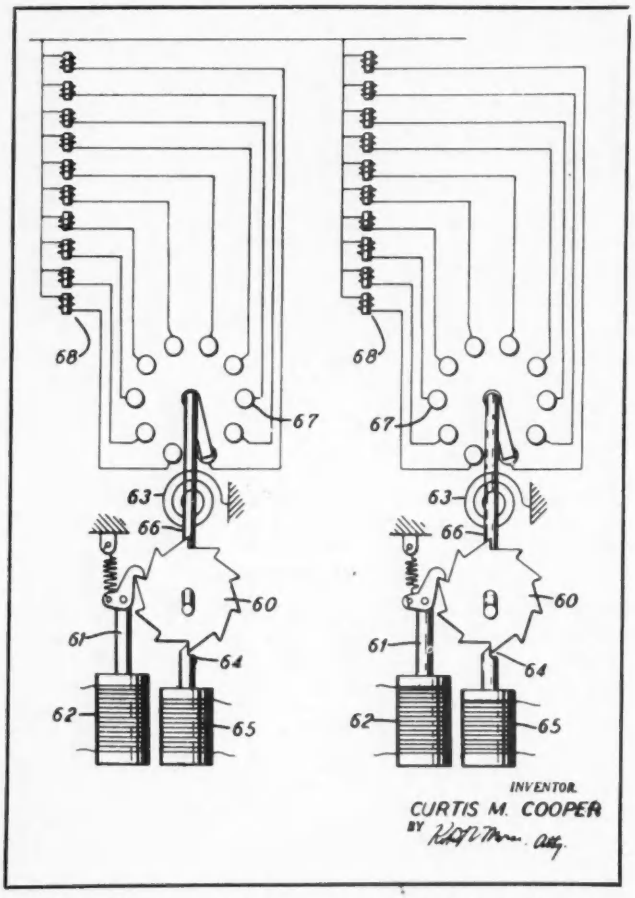

FIGURE FIVE: — Sketch of the punch card receiving machine at which incoming data are temporarily stored until the reading is completed and then released to punch the customer's card.

The wheel turns against a spiral spring (63) and is held from retracting by a ratchet having a stop controlled by the release solenoid. The counting wheel is mounted on the same shaft (66) with a 10-contact rotary switch (67) having individual circuits to 10 card-punching solenoids (68).

When all rotary switches have been set according to the meter reading, the 9-second circuit of the series of seconds in a timing mechanism is closed, sending current through the contact elements of the switches and to the specific card punch solenoids to punch corresponding holes in the punch cards. These punched cards are subsequently employed to compute and send out the customer's bill, using card operated billing machines.

When a card has been punched, a cam at the 9½-second position of the timing mechanism energizes a kick-out mechanism to eject the card and clears the receiving and punching mechanism, dial number storage units, meter reading apparatus, and associated parts, to return to their normal resting position ready to receive another customer's card and start another reading.

The timing elements are controlled either by thermo-switches for the briefer periods, or by motor-driven time switches for the longer periods where a definite cycling control is desired. These are set up so that generally the entire cycle of operation may take ten seconds or less, with a 9¾-second holding cam finally coming into position and stopping the main motor which drives the appropriate timing cams to control the over-all operation. The main motor can usually be set for one revolution in ten seconds, after which all elements return to their normal resting positions, ready for the next cycle of operation.

The co-inventors point out in the patent application on the equipment that, though they have described certain specific forms by way of example, they are merely for the purpose of illustration to make clear the principles of the invention, which is not limited to the particular forms indicated. Rather, it is susceptible to various modifications and adaptations in different installations without departing from the scope of the invention as stated. This invention thus applies to automatic reading of all types of utility meters.

The foregoing description of the automatic meter reading device is of particular interest to telephone organizations, since their lines will be employed to transmit the dialing pulses and the meter reading pulses. This use would add another type of service to the telephone company's tariff, increasing the revenue.

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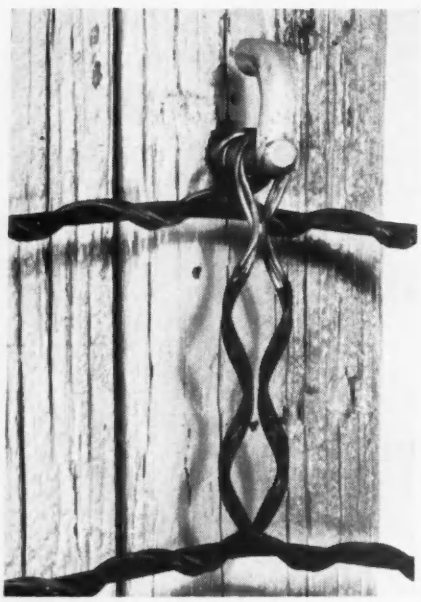
NEW PRODUCTS' SHOWCASE

By DICK REYNOLDS

Loop Tangent Support

PREFORMED Line Products Company has developed a new Elongated Loop Tangent Support to provide a means of stringing two lines of one-pair aerial distribution wires (C-Rural), utilizing only one drive hook.

The new one-piece design incorporates an elongated loop, which, when



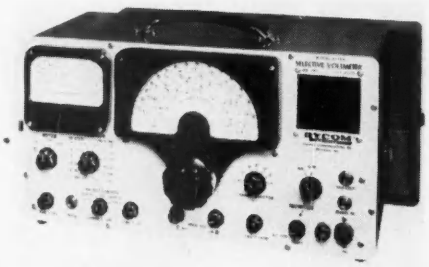
slipped over the drive hook, establishes a fixed dimension between lines at the pole.

The elongated loop tangent support is made of stainless steel, and the legs are neoprene-coated to protect wire from wear and abrasion. *NP* 337.

New Voltmeter

RYCOM Instruments, a division of Railway Communications, Inc., has announced the release of its newest frequency selective voltmeter, the Model 2171A.

The Model 2171A Selective Voltmeter is a highly selective measuring instrument employing the heterodyne principle with balanced modulation. It offers a fast and accurate means of making amplitude measurements throughout the frequency spectrum of 50 cycles to 6 kilocycles. This instrument uses highly selective crystal filter to achieve the resolution necessary for amplitude measurements of microwave subcarrier, wire line communications and subcarrier telemeter-



ing systems. It is available with a 30 cycle or 50 cycle crystal filter for amplitude measurements.

The instrument is supplied in a portable carrying case with a cover compartment for storing test leads or associated tools. Total weight is 28 pounds. It operates on normal line voltage of 115V AC 50/60 cycles and requires 48 watts of power. *Check NP* 338.

Voltage Splicing Tape

A NEWLY developed and improved voltage splicing tape is now being manufactured by Bishop Manufacturing Corp.

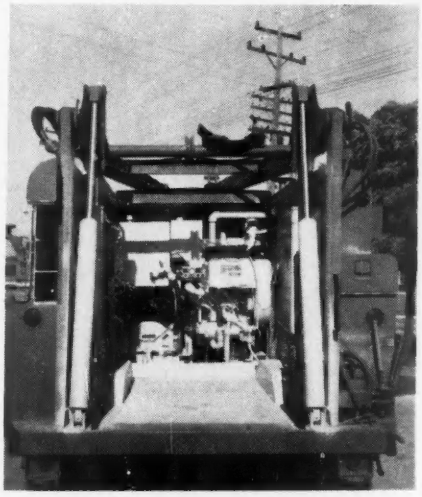
The new No. 30 is clearly distinguishable from the former product by its light grey color and white Holland cloth separator, the old version having had a darker color and varnished cambric separator. The new Butyl

rubber base tape now provides high tensile strength, a high degree of surface tack and fusion, good cold weather handling characteristics, and good storage stability. It meets ASTM Specification D-1373 for ozone and corona-resistant insulating tapes. Its maximum operating temperatures are 90°C up to 5 kv and 85°C up to and including 17 kv. *Check NP* 339.

Hydraulic Equipment

A UNIT designed to power all the hydraulic equipment needed on a utility construction body has been made an integral part of the new Uni-Power Body now being manufactured by Holan Corporation.

The unit consists of a 56 h.p. Wisconsin 4-cylinder air-cooled engine, a Braden Model CL Hydraulic Winch



and a tandem hydraulic pump with 50-gallon reservoir. This package powers the hydraulic derrick, winch, digger and supporting jacks.

The power unit can be lifted out as a unit or by component parts for repair or replacement without removing the body. All hydraulic piping is done under the floor of the body and clear of the chassis. *Check NP* 340.

Carrier Telephone System

LENKURT Electric Company's redesigned and improved 45C carrier telephone system now provides up to

WHEN YOU BUY EXIDE YOU GET YOUR "CHOICE"

Exide-Tytex Batteries with Silvium Grids were chosen by General Telephone Co. of Wisconsin for this exchange at Marshfield, Wis. These batteries now feature improved construction that means longer life and greater economy than ever.

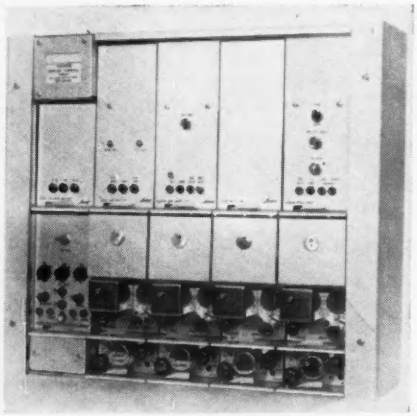
No one stationary battery type meets every user's preference. But Exide offers all types . . . and in every case guarantees Exide quality construction and performance. This is an important reason for buying Exide. With no ax to grind for any particular battery, Exide can give you honest information on all types: Exide-Manchex plante type with Silvium corrosion resistant grids, Exide-Tytex with Silvium grids and Exide-Tytex with calcium grids. Available in the widest range of capacities in the field. So choose the battery that meets your needs exactly. Buy from the Exide line. Rectifier and motor-generator chargers available to cover any application requirements.

For complete information on Exide stationary batteries, write for new illustrated brochure. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 20, Penna.

Exide®

32 toll-quality voice or signaling channels for radio transmission as well as 16 toll channels for open-wire application.

The system is arranged in four groups of four channels each, incorporating an improved model of the 45CB terminals released previously



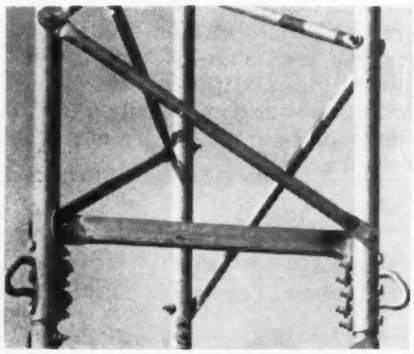
and adding CA, CC and CD terminals and fully-transistorized wire-line repeaters.

Designed primarily for short to medium-haul open-wire routes, the system coordinates with Western Electric Type O carrier and can be interconnected with other 45-class carrier systems.

The system may be installed with a single group initially and then expanded group by group as more channels are needed. *Check NP* 341.

Communications Towers

A COMPLETE line of high strength, tubular alloy steel communications towers, providing structures ranging from 10 to 500 feet in height, is now available from Motorola Communications & Electronics, Inc. All



towers meet or surpass Electronic Industry Association windloading and other standards.

The towers are of three-sided sectional design. The sections are 10 or 20 feet long and in four weights. The heaviest towers can be raised to 500 feet with 30 pounds per square foot windloading, or up to 360 feet with 40 pounds per square foot windloading. Guys are specified for the towers that are more than 100 feet high in the heaviest models, and for lesser heights in the lighter models.

All tower components are "hot dip" galvanized steel to insure protection against the elements. The tower sections are galvanized before being rolled and welded. The welds are sprayed with molten zinc. Samples of all sections undergo "destructive testing" to make certain they are of maximum strength.

Sections are designed for easy assembly and are fastened by drive fit, high carbon steel bolts. All accessories, such as necessary lights, guys, clamps, anchors and assembly hardware, are shipped with each tower. *Check NP* 342.

Air Dryer

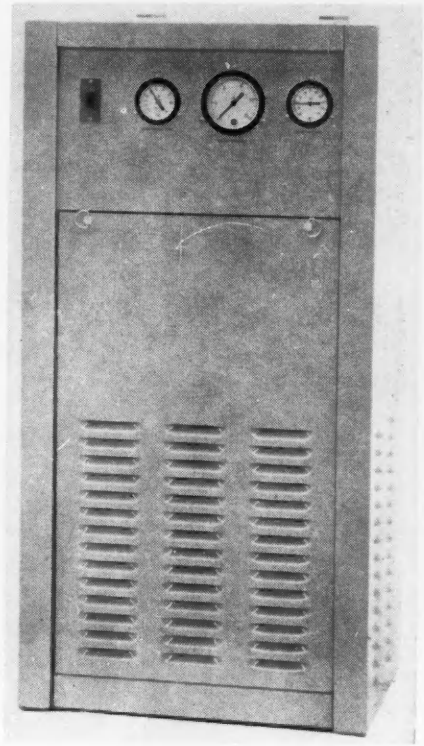
PUREGAS Equipment Corp. has announced the addition of a new intermediate sized air dryer, the Model 1500, to their line of refrigeration-type air dryers for continuous feed pressurization of telephone cables.

The Model 1500 is capable of delivering 1500 standard cubic feet of dry air per day. The unit is fully automatic in operation and is furnished complete with integral air supply, storage tank and alarm facilities encased in a baked enamel steel cabinet.

In operation, room air is compressed to several atmospheres pressure then cooled in a storage tank to approximately 32° F. This "squeeze-freeze" method of air drying condenses approximately 98% of the air moisture content into liquid form which is automatically ejected from the tank. A further reduction in the moisture content per unit volume of air is effected during the expansion of the air stream from the high pressure in the storage tank to the low pressure required and delivered to the cable plant.

By means of the "squeeze-freeze" and "expansion" principles the Model 1500 is capable of reducing the relative humidity of ambient air from 100% at high temperatures to less than 2% at 70° F.

The Model 1500, along with Model 750 and Model 500 Air Dryers now



offers the telephone industry a choice of pressurizing units tailored for the cable network of the smallest dial office to the largest central office.

For specification sheets or descriptive literature on this new Air Dryer, *Check NP* 343.

Electrowriters

COMPTOMETER Corporation has announced its new Electrowriter instruments, which transmit written messages or sketches over telephone circuits.

The new line of Electrowriter instruments include the following: 1. Model 88 Transmitter, 2. Model 88 Receiver, 3. Model 88 Transceiver, 4. Model 89 Transmitter, and 5. Accessories, such as winders for spooling messages, push-button selectors, dial selectors, alerting devices, telephone instruments with manual transfer key, for voice/write service and the automatic "Leave Word" service.

The Model 88 instruments feature a writing surface of 5 inches by 3½ inches. They weigh 30 lbs., have a

NOMINAL WEIGHTS OF FINISHED WEATHER-RESISTANT WIRE AND CABLE

(Pounds per 1000 Feet)

Conductor Size AWG or Mcm	Copper & Copper Alloy Conductors				Aluminum Conductors	
	URC Type Double Braid	URC Type Triple Braid	Neoprene Type	**Polyethylene Type**	Neoprene Type	**Polyethylene Type**
Stranded						
2	246	270	248	**230**	105	**87.4**
4	155	170	163	**143**	73.3	**53.3**
6	103	115	108	**91.5**	51.5	**35.0**
Solid						
2	239	260	232	**219**	92.2	**79.2**
4	151	164	152	**136**	64.0	**48.0**
6	100	112	101	**87**	45.7	**31.7**

Sources: American Standards Association Specifications

This table shows

POLYETHYLENE covered line wire weighs less

Because it's the lightest, polyethylene-covered line wire is the easiest for linemen to string up . . . hardest for ice and snow loading, gale-force winds to bring down.

Polyethylene-covered line wire, depending on size and conductor, weighs from 5% to 32% less than other types. That's what the figures in the specifications tabulated above show.

This, of course, is no news to linemen who have strung all types of weatherproof line wire. They may not be able to quote pounds and percentages, but they all know you can't beat polyethylene on weight.

Linemen's Favorite Material

Light weight means easy handling, one of the main reasons polyethylene rates tops with installation crews. They also like polyethylene wire because it's clean . . . free-stripping . . . has a smooth, self-lubricating surface that almost makes pulling a pleasure. And despite the exterior slip, the plastic covering hugs the conductor tightly, doesn't ruffle as it goes over crossarms.

"Built-in" Safety Factor

Polyethylene's lightness provides lasting mechanical advantages, since span loads don't tax supports as much as heavier type wire. This "built-in" weight safety factor pays off when violent storms push aerial construction to strain limits . . . when ice and snow loads topple heavier lines.

An added factor in polyethylene wire's ability to stay up under adverse conditions is its smaller diameter. It offers less resistance to wind, a smaller surface for ice build-up.

Winning Combination

Called the "closest to the ideal covering for line wire," polyethylene is outstanding in other respects too. The shield it forms over wire is continuous . . . tough . . . resistant to aging, weathering, moisture, abrasion by lashing branches. It's good for decades of superior service marked by fewer outages, minimum maintenance.

When you order covered wire and cable, make sure the coating is made with PETROTHENE® polyethylene resins. PETROTHENE polyethylene costs no more, but it gives you premium weather and stress-crack resistance.

Polyethylene's advantages are outlined in an informative new U.S.I. data sheet, "Polyethylene . . . The Best Line Wire Covering." Also available is a data sheet showing properties, applications and specifications of PETROTHENE polyethylene compounds. Send for your copies today.

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Division of National Distillers and Chemical Corp.
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Please send me:
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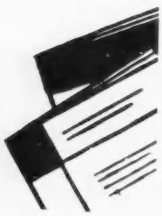
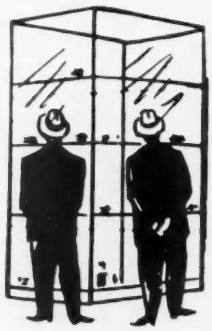
TELEPHONE ENGINEER & MANAGEMENT'S NEW PRODUCTS' INFORMATION SERVICE





Here's how you can get additional information promptly, and at no charge, concerning the New Products appearing in this issue of TELEPHONE ENGINEER & MANAGEMENT. This free information will add to your understanding of the new telephone equipment that is being manufactured for the telephone industry.

All requests are processed the same day they are received, to promptly provide you with the requested information.

1 Print or type your name and address on the coupon below.

2 At the end of each New Product story there is a number. Check the appropriate number on the coupon below. You may check as many as you like.

3 Cut out the coupon and mail it to New Products Department, c/o Telephone Engineer & Management.

NEW PRODUCTS DEPARTMENT **12-15-59**

Telephone Engineer Publishing Corporation
7720 North Sheridan Road, Chicago 26, Illinois

Attn.: Dick Reynolds

Please send me additional information concerning the following New Products.

NP 337..... NP 338..... NP 339..... NP 340..... NP341.....
NP 342..... NP 343..... NP 344

NAME ..... POSITION .....

COMPANY .....

ADDRESS .....

CITY..... ZONE..... STATE .....

power consumption of 13 watts, and use a power source of 105-125 volts, 50-60 cycles. They use either roll or

Model 88 Transceiver.

fan-fold paper, plain or printed. Rolls contain 400 frames, 6 inches by 6 inches. The standard fan-fold package contains 900 forms, 6 inches by 6 inches. Packets containing 2,000 forms are also available.

The Model 88 Transceiver is a

Model 89 Transmitter.

single unit transmitter/receiver. When transmitting, the stylus is attached to the pen. Upon completion of the transmission, the equipment automatically switches to the receiving position.

The Model 89 Transmitter is designed for special applications on wire or radio circuits. It is a portable transmitter which weighs 3½ lbs. and is battery operated and transistorized.

Four special demonstrations were prepared by the Communication and Electronics Division to illustrate how the Electrowriter instruments transmit written messages over telephone or radio circuits. *Check NP* 344.

check LINE CARDS with HANDS FREE

ACME VISIBLE V-ANGLE TRAYS speed subscriber service by reducing card-handling time

FLIP OPEN AT ANY CARD . . . the Supported V-Angle keeps the card in position without being held. User's hands are free to take notes or use telephone. **IF CARDS ARE REMOVED** for posting or replacement, special Measured Space Control keeps space ready for refiling, even though tray is in constant use. **USE TRAY FROM EITHER END,** thanks to Acme Visible Two-Way Lock-In Indexors.

LIKE ALL ACME VISIBLE TELEPHONE EQUIPMENT, the Supported V-Angle Tray is designed by Acme Visible Systems Engineers working closely with experienced telephone operations experts. Send coupon for free literature on full line of efficiency aids for telephone paper work.

ACME VISIBLE

World's Largest Exclusive Makers of Visible Record Systems
ACME VISIBLE RECORDS, Inc.
0000 North Allview Drive, Crozet, Va.

Without cost or obligation, please send more information about your new equipment and systems for handling telephone records. And give the address of the nearest representative in your nationwide sales and service organization.

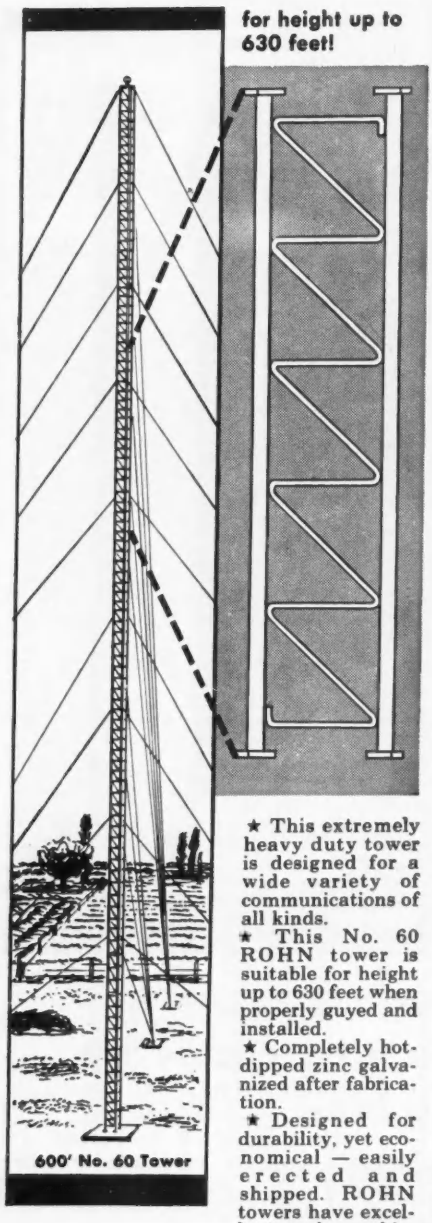
We have_____line cards and_____ cable and terminal records to handle.

NAME_____ TITLE_____

ADDRESS_____

CITY_____ ZONE____ STATE____

ROHN COMMUNICATION TOWER *No. 60*



★ This extremely heavy duty tower is designed for a wide variety of communications of all kinds.
★ This No. 60 ROHN tower is suitable for height up to 630 feet when properly guyed and installed.
★ Completely hot-dipped zinc galvanized after fabrication.
★ Designed for durability, yet economical — easily erected and shipped. ROHN towers have excellent workmanship, construction and design. Each section is 10 feet in length.

FREE

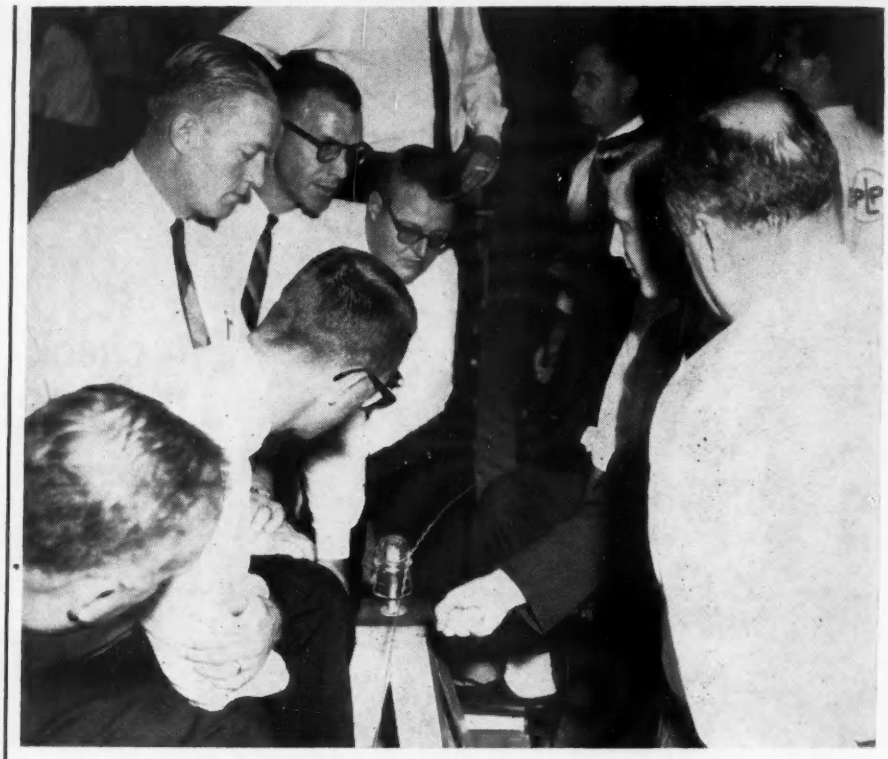
Details and complete engineering specifications gladly sent on request. Also ROHN representatives are coast-to-coast to assist you.

Write-Phone-Wire Today!

ROHN *Manufacturing Co.*

116 Limestone, Bellevue, Peoria, Illinois
Phone 7-8416

"Pioneer Manufacturers of Towers of All Kinds"



Preformed representatives hold training conference.

Preformed Line Holds Training Conference

THE RAPID succession of new product developments and the attendant need for their proper introduction to telephone companies and REC's in the Western States prompted Preformed Line Products Company to conduct a shirtsleeve training conference for western representatives at its Cleveland, Ohio, headquarters offices.

The three organizations represented were: Shaffer & Nelson, Inc., in Washington, Oregon, Idaho, western Montana, and Utah; K. M. Ryals Company in northern California and western Nevada, and Earl S. Condon Company in southern California, southern Nevada and Arizona.

Working under the supervision of the company's field demonstrators, the representatives learned to make installations of Preformed line accessories for new construction, repair, and maintenance of open line wire, one-pair aerial distribution wire and rural distribution wire. Another purpose of the conference was to coordinate the sales and service activities under Kenneth R. Miller, newly appointed district manager of Sales, Western Area, and Harry J. Billica, communications consultant, both located at the Preformed plant in California.

Particular emphasis was placed on installing the four Preformed products which comprise an entirely new construction concept for open line wire: Communications Tie for making uniform cradled attachments at the insulator; Plastic Spacer Unit (PSU) for the elimination of mid-span hits; Plastic Vibration Damper (PVD) for arresting vibration; Plastic Pinch Bracket (PPB) for controlled spacing before transposition.

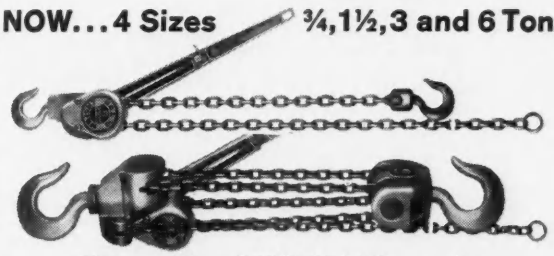
Service Equipment Brochure

SUTTLE Equipment Corp. has a new brochure available listing station apparatus, receptacles, outlets, junction boxes and other station installation hardware and equipment. The brochure indicates the improved salability of new homes and buildings where architectural or builder's plans call for pre-wire telephone service, just as electrical service is furnished in a new structure.

Operating telephone companies may wish to obtain a quantity of these brochures for distribution to architects and builders in their area. Copies are available at cost by writing *Suttle Equipment Corporation, Dept. TEM, Lawrenceville, Illinois.*

New ¾-ton Type "C" Pull-A-Way

NOW... 4 Sizes ¾,1½,3 and 6 Tons



WRIGHT Type "C" Pull-A-Ways make easy work of hundreds of quick hook-up jobs. Now available in four sizes—¾, 1½, 3 and 6 ton—Type "C" Pull-A-Ways are portable, safe and rugged. Corrosion-resistant modern aluminum alloy castings are used for gear case, handle and covers of all models. Hooks, load chain and chain sheave are made of alloy steel. Positive, dependable load brake securely holds load at any point. Lubricated for life. Weights: ¾-ton, 14 lbs; 1½-ton, 23½ lbs; 3-ton, 36½ lbs; 6-ton, 63 lbs.

Write to our York, Pa., office for Bulletin DH-56A

WRIGHT HOISTS

Wright Hoist Division • American Chain & Cable Company, Inc. ACCO

York, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

TYPE 16-B MULTI-STATION 7-CHANNEL CARRIER

is your low-cost answer!

Budelman Type 16-B Carrier will:

- Provide additional circuits on existing multi-station lines.
- Provide additional circuits on new multi-station lines.
- Improve service on existing multi-station lines.
- Provide new circuits to new stations in areas beyond the 1200 ohm loop.
- Provide additional trunks to remote PBX, PABX, or key telephone systems.

FULLY SELECTIVE 10-PARTY DIVIDED RINGING
SEMI-SELECTIVE 10-PARTY BRIDGED RINGING
SINGLE FREQUENCY CODED RINGING

all this without additional wire lines —without disturbing existing services!

7 Channels — 10 to 140-kc freq range. Applicable wherever attenuation at carrier frequencies does not exceed 35-db.

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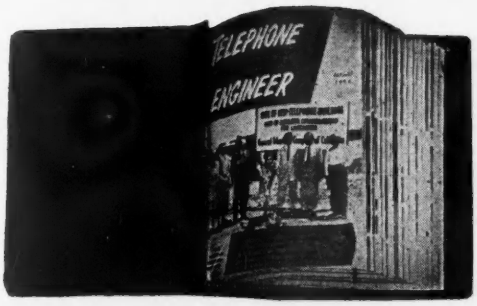

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Printed by

R. R. Donnelley & Sons Company

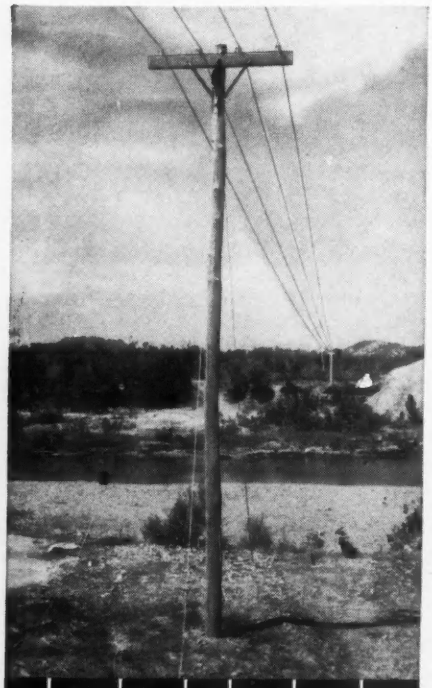
350 East Twenty-second Street, Chicago 16

Crapo
HTL-195
EXTRA HIGH-TENSILE TELEPHONE LINE WIRE
for low-cost Rural Lines

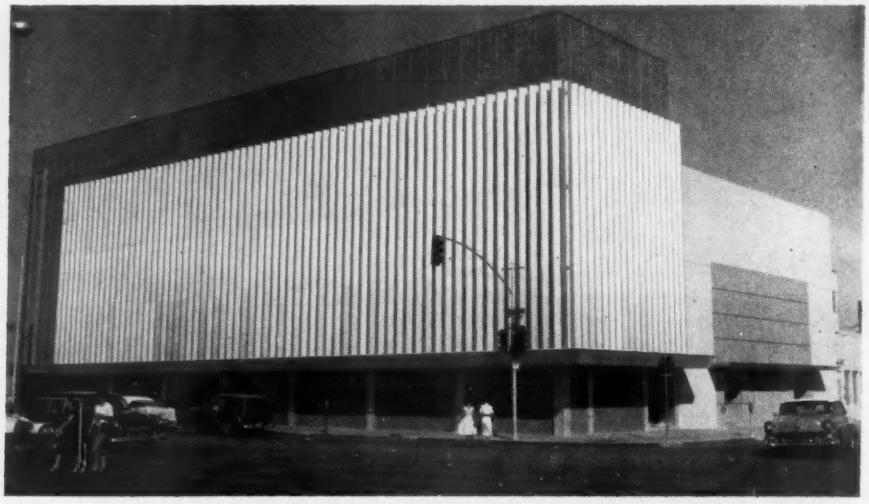
• Spans up to 600 feet in Heavy Loading, 650 feet in Medium Loading and 700 feet in Light Loading districts are possible where Crapo HTL-195 is employed. This extra long span construction results in marked savings in costs per mile of line. Pole structures can be reduced to a minimum. Fewer pole structures mean substantial savings both in materials and man-hours of labor. There is less hauling to be done, fewer holes to dig, less material to be handled, installed and connected.

Improved electrical qualities make practical typical subscriber loops of 14 to 15 miles with normal voltages and equipment. Also can be used for subscriber carrier.

Write for Engineering Manual No.TM-59



INDIANA
STEEL & WIRE CO., INC.
MUNCIE, INDIANA



THE SOUTHERN NEVADA TEL. CO., Las Vegas, has opened its new downtown general office building. The five-story structure, which cost $500,000, is entirely occupied by company personnel. The street floor provides a modern commercial office, with a "drive-in window" for payments through the public parking area.

Rochester Tel. Reorganizes Engineering Department

THE ROCHESTER (N. Y.) Telephone Corp. has announced the reorganization of its engineering department, plans for expanding the department personnel by more than 10% to keep pace with an accelerated construction program, and the establishment of a suburban engineering office at Geneseo, N. Y.

According to chief engineer William A. Pitbladdo, the realignment of duties is designed to correspond with a recent reorganization of the company's plant department. The engineering department is responsible for planning and designing line and cable routes, manual and dial equipment, and new facilities. The plant department is responsible for the actual construction, installation and maintenance of such facilities.

The expansion of the engineering department will come about through transfer of personnel within the company to meet the needs of a larger construction program planned for next year. More than $10,000,000 will be spent by the company this year for new construction purposes.

Named outside plant engineer is Clarence Marble, formerly plant engineer. He will supervise four engineering managers and be responsible for planning and design of all outside facilities.

Richard V. Walrath will retain the title of equipment engineer and will be responsible for the engineering of all company equipment.

G. William Miller, formerly special studies engineer, has been named to the new post of property records engineer. He will be responsible for the maintenance of detailed records on all company property.

Joseph A. Hill, formerly district traffic engineer — city, has been named traffic engineer and will be responsible for the planning and design of all switchboard and dial switching facilities.

Donald F. Brelos, formerly administrative engineer, has been appointed staff administrative engineer. He will be responsible for coordination of scheduling activities and supervision of the office staff of the department, and will develop planning functions and other staff operations.

Gen. Tel. Names Director Of Product Development

DONALD E. KLANG, secretary of the technical policy committee at General Telephone Laboratories, Northlake, has been appointed director of product development at General Telephone & Electronics Corporation.

In his new position, Klang will guide the various customer-premise communication products and services from the idea stage through their complete development.

He started with the General Telephone Laboratories organization in 1949, was transferred a year later to the engineering department of Auto-

matic Electric Company, then became assistant to the vice president and general commercial manager, and finally planning engineer.

Stromberg-Carlson Names Marketing Research Director

A FORMER U. S. Rubber Co. representative, John A. Connon, has been appointed director of marketing research at the Stromberg-Carlson Division of General Dynamics Corp., Rochester, N. Y. Connon will direct

JOHN A. CONNON

and coordinate all marketing research activities in Stromberg-Carlson's various product divisions.

Prior to joining Stromberg-Carlson he served as a special representative of the U. S. Rubber Co. in New York and Los Angeles; management consultant with Booz, Allen & Hamilton, New York; special assistant to the marketing vice president of the Hamilton Watch Co., Lancaster, Pa.; and general manager of the Hathaway Instrument Division of the Hamilton Watch Co., Denver.

John J. Douglas Named President, Lenkurt Electric

JOHN J. DOUGLAS, who has been in the Independent telephone industry nearly two decades, is the new president of Lenkurt Electric Co., San Carlos, Calif., and George F. Koth, an officer and director of Lenkurt since shortly after its founding, has been promoted to vice president and general manager of the carrier

JOHN J. DOUGLAS

and microwave manufacturing firm.

Douglas and Koth take over the positions formerly held by Lenkurt co-founders Lennart G. Erickson and Kurt E. Appert, who will continue to be interested and active in the affairs of the company as members of the board of directors.

Douglas has been serving as vice president and treasurer of the telephone equipment manufacturing and sales companies of General Telephone & Electronics Corp.

Koth joined Lenkurt in 1946 as production manager when the com-

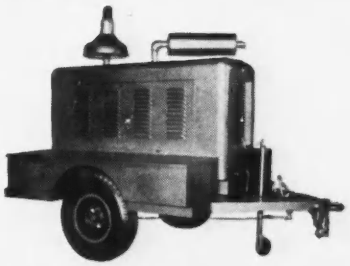
GEORGE F. KOTH

pany was located in San Francisco. In 1947, when the firm moved to its present location in San Carlos, he became works manager. He was elected a director in 1948, and vice president in 1952.

There's VERSATILITY in TELEPHONE SYSTEM SERVICE and Portability with...

U.S.

Complete "versatility" is possible for telephone system service with portable U.S. Versa-Trailer standby emergency power units in sizes from 10 kw to 35 kw capacity.



Units provide both single phase power for lights and 3-phase power for other needs. Many exchanges in an area can be served by a single unit.

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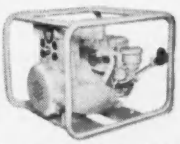
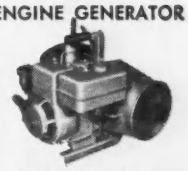


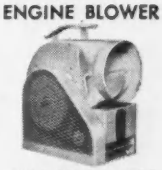
ENGINE GENERATOR

Portable engine blowers provide convenient means of furnishing fresh air to manholes, or for ejecting smoke, fumes, etc.



ENGINE BLOWER

Motor driven blowers like engine driven counterparts, are invaluable for exhausting contaminated air.



MOTOR DRIVEN BLOWER

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UNITED STATES MOTORS CORPORATION
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110 W. 5th Ave. / Oshkosh, Wis.

TELEPHONE MARKET PLACE

Largest Circulation Serving The Telephone Industry

HELP WANTED

AMBITIOUS MEN — Qualified as station installers, equipment installers, cable splicers, linemen. Work in midwest. Harris-McBurney Co., Inc., P. O. Box 267, Jackson, Michigan.

MANAGER for expanding R.E.A. Telephone Cooperative. Serving 500 dial subscribers, all new plant, and 270 common battery subscribers to be converted to dial in 1960. All Stromberg C.O.E., considerable Panhandle and Stromberg carrier. Administrative, technical, plant and R.E.A. commercial knowledge desired. B.S.E.E. or other degree preferred but not mandatory. Main office Missoula, Montana. Contact Blackfoot Telephone Cooperative, Inc., Box 1474, Missoula, Montana for information and application form.

CENTRAL OFFICE EQUIPMENT REPAIRMAN with some cable experience. Western Electric TPS and XY TPL equipment. Immediate opening in West Texas. Send complete resume to Box 87, c/o TE&M, 7720 Sheridan Rd., Chicago, Ill.

CABLE SPLICERS. Station Installers, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1800 Johnson Street, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

TELEPHONE ENGINEER — Must be an electrical engineering graduate with experience in plant, traffic and commercial departments. This is an unusual opportunity for an engineer with managerial and administrative ability to use and develop all of his possibilities. Location — Southern Connecticut — at the headquarters of a nation-wide utility company. Reply sending a complete resume to Box 90, c/o TE&M, 7720 Sheridan, Chicago, Ill.

EXPERIENCED C.O.E. INSTALLER: Dial and manual equipment. Must be familiar with different types of equipment. In your reply please state age, experience, references, types of equipment worked on, salary and when available. All replies confidential. Write Box 89, c/o TE&M, 7720 Sheridan Rd., Chicago, Ill.

HELP WANTED — Southeastern Telephone Company located in North Florida. Wanted: Journeymen, Cable Splicers and Station Installers. This fast growing telephone company has 35,000 stations, located in towns near Gulf Coast. Reply to District Plant Manager, P. O. Box 1080, Tallahassee, Florida.

CENTRAL OFFICE Equipment Maintenance Men and Central Office Equipment Installers. Southeastern Telephone Company located in North Florida. This fast growing telephone company has 35,000 stations, located in towns near Gulf Coast. Reply to District Plant Manager, P. O. Box 1080, Tallahassee, Florida.

HELP WANTED

COMBINATION MAN experienced in dial equipment and plant maintenance. Supervision of 1100 stations. Midwest Telephone Co., Inc., P.O. Box 54, Petersburg, Indiana.

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MAGNETO TELEPHONES — Leich 901 wall or desk magneto telephones. Cleaned, tested and guaranteed, $16.50 each. As removed from service $15.00 each. Turtle Lake Tel. Co., Turtle Lake, Wisc.

STROMBERG-CARLSON Junior Multiple Common Battery Switchboard — M D F — Relays — Charger — 24 volt battery. Write for more information and price to: Farmers Independent Telephone Company, Grantsburg, Wisconsin.

ONE KELLOGG 1040 Crossbar dial switchboard; 500 lines; equipped with all relay line controller strips; suitable as addition to existing office of similar type. In excellent condition. Will sell all or part. Available now. Harold O. Davis, Western California Telephone Company, Los Gatos, California.

ONE 1955 Willys 4-wheel drive truck, Stahl Telephone Body, front-mounted live boom and digger, 2 winches, 14-inch auger digs holes 6 ft. deep, and take-up reel operated from P.T.O. Price, $2,500. Will send picture and more information upon request. One Stromberg-Carlson 121 cordless PBX — 3 trunk, 16 line (wired for 5 trunks) replaced by larger PABX — in perfect condition. Price $500. One W.E. 550B C. B. PBX 3 trunk-20 line-new jacks, cords and plugs. Good operating condition. Price $75. Thorpe Telephone Company, Thorpe, Wisconsin.

WANTED TO BUY

WANTED — All makes, old telephones. Our truck will pick up and pay you cash on the spot. Telephone Co., Turtle Lake, Wisconsin.

TELEPHONES — Any condition. Desk stands, wall sets, etc. Advise quantity available. Write Box 78, c/o TE&M.

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BELTS — CLIMBERS — Complete Linemen's equipment, W. M. Bashlin Co., Bashlin Bldg., Grove City 1, Pa.

FOR SALE

FOR SALE

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2. Two North all relay MCX200 (broad-span) switchboard, charger, batteries, main frame, and powerboard. Both equipped with 100 lines, 200 line capacity. Available after February 1960. **$2,000 each.**
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4. Used dial telephones:

443 Western Electric 302-D
84 North 9800
29 North 9000
208 Leich 615
71 Stromberg Carlson 1243
78 Stromberg Carlson 1250

Prices range from $5.50 to $6.50 Each.

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STERLING
EARTH BORING MACHINES
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CORDS, Switchboard & Telephone — Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago 41, Ill.

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Made for trucks and equipment
Small or large quantities
Write for free catalog.
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Here are three jobs you can do quickly and easily with classified ads in TELEPHONE ENGINEER & MANAGEMENT. With the largest circulation of any telephone magazine TE&M reaches the people who will be interested in your offer.

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Get the help you need with a low cost TELEPHONE ENGINEER & MANAGEMENT classified ad. Here is a huge market in which you can hire executives, engineers, and skilled workers for every department. Place your ad today.

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If you have an exchange or any other kind of business to sell, advertise it in TELEPHONE ENGINEER & MANAGEMENT. Your ad will reach more prospects than you can reach in any other telephone publication. Place your ad today.

How To Place Your Ad

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Use This Space to Print or Type Your Classified Advertising Message

CLASSIFIED RATES: 15c per word, minimum charge $2.00. Cash with order. Add 4 words for box number. Closing deadline: Copy in written form in Chicago office no later than 15 days preceding publication date.

DISPLAY CLASSIFIED RATES: Take card rate of $7.00 per column inch, and card discounts, size and frequency apply.

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TELEPHONE MARKET PLACE

(Continued from page 87)

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There are just 2500 of these sets available. We will sell "as removed from service" or reconditioned. Write or phone for prices today.

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PROTECTIVE EQUIPMENT — Reliable Electric Company, 11333 Addison St., Franklin Park, Ill.

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NON-RESIDUAL
CONTACT BURNISHER
FOR USE ON ANY TYPE CONTACT
- No residue.
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- Economical—flexible—insulated.
- Each one comes in vinyl case.
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SAMPLE TRIAL PKG. OF 10—$3.50. 50 TO 950—24c each.
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WIRE INSULATED — Dated drop wires and all types of telephone wires — Alpha-duct Wire & Cable Company, New Brunswick, New Jersey.

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(Some others for use in above equipment)
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$16.00

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one million in stock
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(equipped as desired)
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North, all relay, PX-80
80 line (50 equipped) 7 link (6 equipped)
(complete with power supply, 48V)
12" x 51" x 81" overall, no provision for trunks.
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94G	3.50
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20A Repeating	$2.00
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— Dry Line Type —
TP 14 (portable) 2-4 wire
12-18 DB gain (resp.)
—intermediate or end
Ring By-Passed
115-240 VAC—12 VDC
Mfg. by Federal, etc.
Moisture-proof wood case—removable for 19" rack mounting
11"x18"x8"—46 lbs.
$500.00 Value—New—$125.00
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All New Material (unless otherwise noted) priced F.O.B. Los Angeles
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Call any of our offices
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Zener Diode Slide Rule

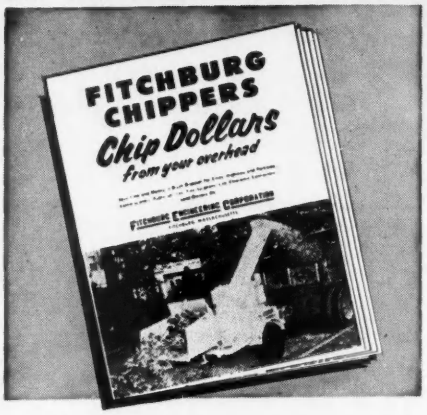
A NEW slide rule is now available from Motorola to simplify calculations that are necessary to design zener diode circuits. Among the calculations that can be made are: value of the ballast resistor; maximum zener dissipation; required thermal dissipator or heat sink area; and change in regulated voltage with ambient temperature. The various scales eliminate the need for using several curves.

Useful design information has been included as part of the calculator, such as a basic regulator circuit, various relationships, and tabular design data.

The Motorola zener diode slide rule can be ordered for $1.00 each from any of the twenty-two Motorola Semiconductor distributors located in major cities in the U.S.A. For further information write *Dept. ZDSR, Motorola, Inc., Semiconductor Products Division,* 5005 *E. McDowell Rd., Phoenix, Arizona.*

ALLAN M. ANDERSON has been appointed division manager of the San Francisco Division of General Telephone Directory Co. The division encompasses the Central and Northern California areas. Anderson started with the General Tel. Directory on May 5, 1947 as a sales representative. He was appointed sales supervisor in 1950, and in 1956 was promoted to assistant division manager of the Long Beach Division. In 1958 he was transferred to San Francisco to establish an office and continued to report to the Long Beach office until his recent appointment.

HOW TO SAVE MONEY IN BRUSH DISPOSAL



Read how foresters, tree surgeons, highway and park commissions, telephone, power and gas companies cut brush disposal costs up to 50% with a Fitchburg Chipper.

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12-15-59

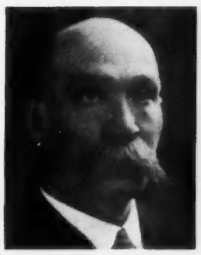
STROMBERG-CARLSON

Transmitter

A DIVISION OF GENERAL DYNAMICS CORPORATION

News and views of Independent telephone people. VOLUME 8, NO. 9 • DECEMBER, 1959

to you from the men who are Stromberg-Carlson



Left: Carlson
Right: Stromberg

Which is Alfred Stromberg? Androv Carlson? You probably don't know—we had to check to be sure. And where did they establish the company with this proud name in Independent telephony?

You may remember that the operation began in Chicago, in 1894. But is that important? Stromberg-Carlson —to you—is not primarily an organization, or a product, and it certainly isn't history. It's the man who stops by, to give you a lift with problems, to rejoice in your success, to cement the friendly ties of common understanding.

If you live and work in the throbbing heart of our country—the "Chicago Territory" — you know Mr. Stromberg-Carlson. He's on this page. If you live in another section, turn the page and you'll find your own Mr. Stromberg-Carlson. At Christmas . . . at any time . . . he's thinking of you.

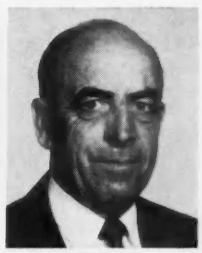
To Chicago Branch customers, these men are Stromberg-Carlson

Marty Bolluyt
Illinois

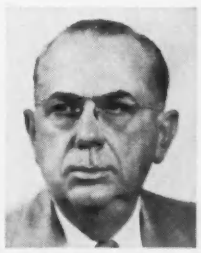
Vic Burchett
Minnesota, North and South Dakota

Jeff Fairly
Iowa

Ken Jenkins
Indiana, Kentucky and Tennessee



Leo Rubendall
Wisconsin



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Special help as needed— *Home Office managers and staff*

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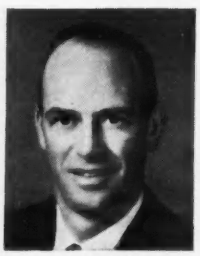
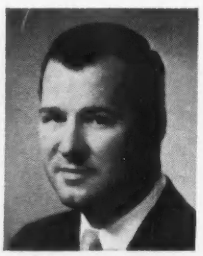
Headquartered at the geographical center of our country, this Branch has 2-way single party service lines fanning out in all directions.

Representing your interests in the widespread Kansas City operation

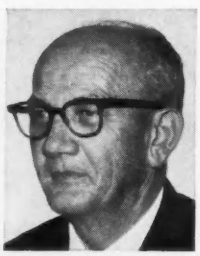


Marv Hill
Arkansas
Louisiana

Jim Howell
West Texas
New Mexico



Bill Huddleston
Nebraska, Colorado
Wyoming, Kansas



Frank Micka
Oklahoma
Southern Kansas

Carl Price
East Texas

Ed Sears (Jr.)
Missouri

Sales Engineering Assistance

Al Gear

Bill Riley

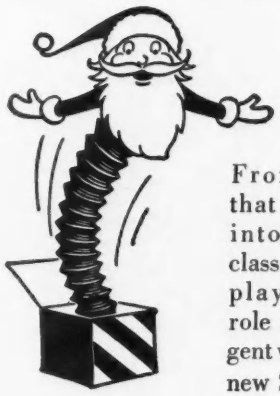
Emmett Shanks

Bob Wohlberg

Manager

R. F. (Fred) Fairly
Kansas City Branch Manager

People whose interest is you.



Yuletide cheer from Atlanta: 404-TR5-7467

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Alabama, Mississippi

Milo Kingsbury
Virginia, Georgia
East Tennessee

Bob Lake
North and
South Carolina

Dave McNish
Virginia

Manager

W. L. (Moon) Mollands
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Nevada, Arizona

Ernie Larson
Western Oregon
Washington, Alaska

Ken Johnson
Sales Supervisor

West Coast Sales Engineering Staff

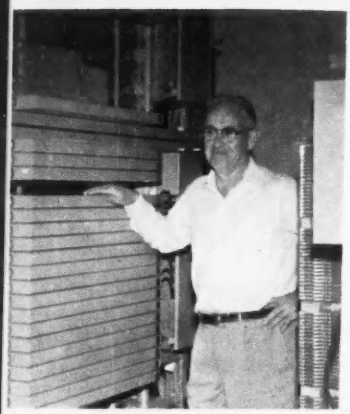
Ken Kelly

Bob Leary

Fred McGrady

Manager

J. P. (Joe) Galligan
San Francisco Branch Manager



"I'll take trouble-shooting over foreclosing a loan any time," says Owen T. Jenkins, mgr. at Shinglehouse, Pa. He was a banker before he took over telephone properties.

Birds will have to look harder for home sites, as cable replaces open wire in plant modernization. This could be anywhere . . . actually is Coalport, Pa.

How green was the valley!

How green the valley must have been — this giant prehistoric valley of Pennsylvania! Here, long ages ago, was laid down the mineral wealth that turns the wheels of our economy. The valley is gone . . . heaved into mountain ridges, tortuously upended, yet in this contortion unlocking the treasure buried beneath.

Coal built Pennsylvania — and our country. Coal means steel, glass, electricity, nylons and pills. This summer it rode with us to each call in the Keystone State . . . except *Shinglehouse.*

Shingles—as common as nails! But

Paul Kalp and Mrs. Kalp (right) with Mrs. Forbes relax for a moment after a home-style picnic . . . a few "country miles" from the hustle of metropolitan Pittsburgh.

"We're a little off the tourist route," said Guy Heil, manager of the telephone company at Coalport, Pa. Violet Peterson, secy., and Vera Smith run business office.

It was right ther

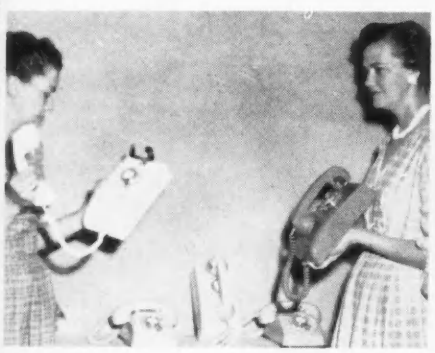
when a pioneer in northwestern Pennsylvania decided to make and use them, his house *named* the settlement! For years the town was comfortable but undisturbed. Then came oil, near the turn of the century, and until the late 1930's oil provided the principal wage. Even now old wells are used as reservoirs, enriching the piped-in western gas.

Owen T. Jenkins was the banker in Shinglehouse — a job that became distasteful as hard times came. One day in 1940 he attended a meeting of other bankers in Wellsboro, where he was given a take-it-or-leave-it proposition: managing the telephone properties. He took it, and for many a day wondered why. All he needed was customers who could pay bills, a plant that was off the ground, equipment that could be operated. All he *had* was courage.

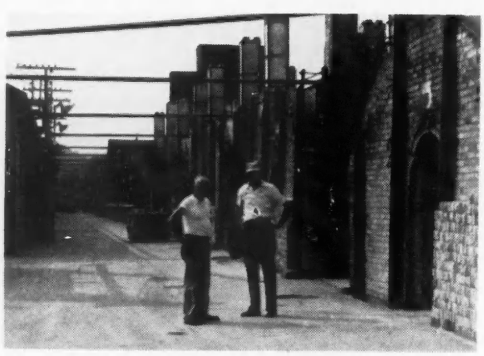
The first requirement was an overall plan and money — more than he could raise locally, not enough to interest the larger lenders. Condensing months into a phrase, Mr. Jenkins' Oswayo River Telephone Company became one of 7 trial loans leading to the formation of the Stromberg-Carlson Credit Corp. Owen Jenkins will never again question his entry into the telephone business. For one thing, his 1500 satisfied subscribers wouldn't let him go.

Knox is more typically Western Pennsylvania. Built around the Knox

Beryl V. Cobbler, manager of Rural Telephone Company at Knox, is also president of Pennsylvania Independents.

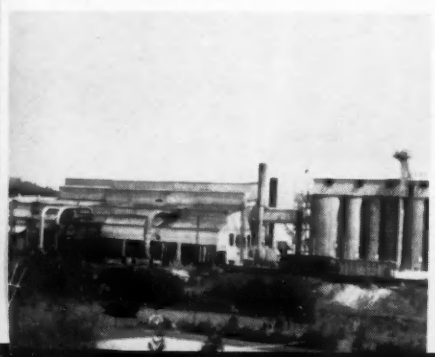


"No question about wanting color . . . it's just that I love all of them." Wall phones demonstrated by Mary Lou Barnhart (right) of the Ligonier Valley Telephone Company at Stahlstown, Pa.



There's more than coal in Coalport. One of the largest ceramic tile works in the country makes sleeves, nozzles, bottom-pour bricks, gates and ladles used in the steel industry.

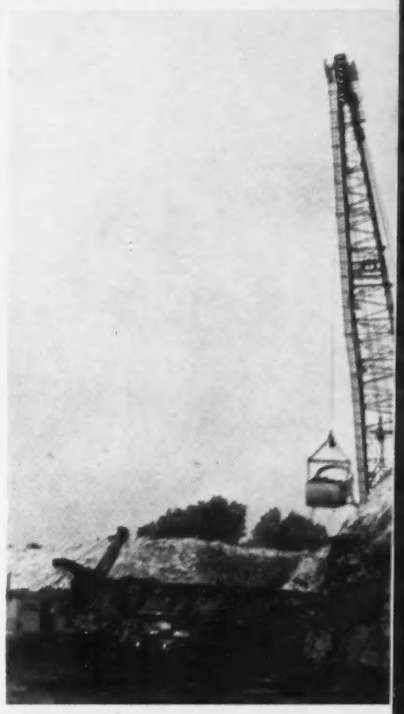
The Knox Glass Company has home office and a principal factory at Knox, Pa.



Mr. Joseph Pilch, field representative of the R.E.A., with Mr. Paul Kalp (right), manager, dotting in new service requests on Stahlstown area map.

Family fun. An unexpected bonus during visit with Mr. and Mrs. O. T. Jenkins of Shinglehouse was the chance to see the second and third generation, including son Ken and family from Seymour, Ind.

New XY Dial office, new test board, quite new diploma from XY Training School . . . and brand-new wife for Edward McCamant, wire chief of the Rural Telephone Company at Knox.



17 yards (three truck loads) at one scoop! Coal stripper moves mountains to expose "pay" layer; then coal is dug with conventional power shovel, trucked to rail-side tipple at Coalport.

ht there waiting for them

Glass Company (bottles and containers), the city and environs claim diverse interests. The second-oldest pig iron furnace, the oldest golf course in the country, large pottery works, a nationally known theater-in-the-round, and of course coal — pit and strip.

The Rural Telephone Company last year renewed its 50-year-old charter, keeping the misleading "Rural" in its name. While the conversion to XY® Dial is recent, good service is a tradition. A neighboring town recently petitioned Knox to serve them. This was done by building around them, eventually taking over the exchange.

Mr. Beryl Cobler, general manager at Knox, has been in the telephone business for 40 years; Pennsylvania Independents have just made him their president. To assist in the commercial and public relations side of the business, Mr. Carl Clover has become secretary-treasurer. As you would expect, both are civic leaders.

To find *Coalport* was easy! Drive to the top of a mountain, spot one of the world's largest draglines, throw away your map, and take either a right or left by flipping a coin. Nestled almost between the legs of a tipple, filling 50 coal cars a day, is the telephone office. Guy Heil, manager, and the ladies of the business office knew we'd make it.

When Mr. Heil took over this franchise in 1929, there were 70 subscribers, no plant worthy of the name, lots of debt. The region hasn't changed much in 30 years, but the company certainly has. With 800 subscribers now on the books, XY Dial service, and a new plant throughout, the future looks good.

In the area served, Coalport is central. Through the use of 541 Negative Impedance Repeaters, all lines could be brought into the one central office to increase efficiency and save expense.

Proud as he is of the exchange, Mr. Heil seemed a little "itchy" to take us out to the coal fields. This we'll long remember.

"Drive on," he urged, pointing to foot-deep truck ruts ahead. "You don't have anything like this in Rochester."

"A messy place to get stuck," I thought out loud. "Can't we walk?"

"Stuck! It's solid rock." Mentally I figured the cost of a new transmission as our hub caps disappeared in inky slime.

"These boys are my friends. They'll pull you out with a 'cat' if I ask them to." This, at least, was reassuring.

We did arrive, next to a bucket that would garage our car. Straight up — twenty stories high — was the boom; some 40 feet in the air, the control cab. You could buy an XY Dial office for a small city with the price of this Gargantuan clam that plays sandbox games with mountains.

An hour later, as we low-geared a precarious way back to the road, I asked, "How do they know where to dig?"

"I tell them," was Mr. Heil's reply.

Stahlstown, by comparison, seemed a haven of rest. Here the valleys are still green — noise, dirt and confusion well out of sight. Historically, this is the scene of the blood-bathed struggle for the Forks of the Ohio: in neighboring Ligonier, General Forbes built a provisioning fort before leading the successful assault on Ft. Duquesne. Today it is rural beauty, just beginning to feel the impact of suburbanism.

It is to meet this suburban tide that Mr. Paul Kalp, recently made manager of the Ligonier Valley Telephone Company, has completed a modest but thoroughly modern exchange. The old magneto board, with an assist from a wired-in auxiliary position, barely made it to cutover. Now people can have the upgraded service they long wanted, and the "extra" lines are fast filling up as private estates become housing developments. The industrial complex that is greater Pittsburgh holds the key to the future — one which presently is unpredictable. Next month we move into this restless metropolis.

This delightful young lady enjoys helping the grownups with their decorating duties. The snow is as beautiful as any in the great outdoors, but it lasts longer.

Here's an idea to brighten Christmas . . .

Christmas is the sparkling season of Santas, sleighs, stockings and, now, soapsuds. That's right, soap plays a big part in one of the best holiday decorating ideas that's come along in many a snowfall. We thought you (or maybe your wife) would like to hear about it.

You can use these glistening suds to decorate your Christmas tree and gift boxes. Whipped up, they look just like snow. The snowlike suds bring three-dimensional art work to your mirrors or windows. And they provide an effective safety valve for your youngsters' excitement.

"Suds-snow" is a snap to make. You pour a few cups of packaged soap into a bowl and add a little water. Then beat with electric or hand mixer until suds have the consistency of whipped cream — and you're ready to decorate.

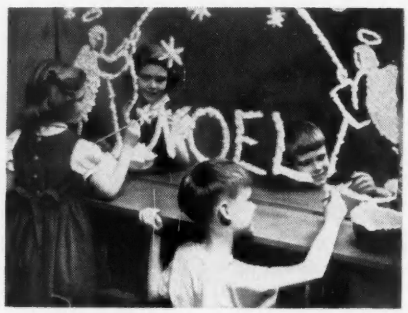
Brighten up your tree with some "snow" on its boughs. Then complete your decoration with ornaments made from the same basic soap — but mixed to a doughlike consistency.

Fill a cookie press with these thick suds. Then press snowflake circles or diamonds with holes in center onto a cookie sheet. Finally, add glitter for a sparkling touch. After drying for 24 hours, they're ready to be tied to the tree with colorful ribbons or string. You can also glue them to flat surfaces.

Suds-snow is handy for decorating gift packages too. Just wrap your presents and fill a pastry tube with medium-dense suds. You're all set to draw any appropriate design for the occasion. These snow-covered gifts are nearly as much fun to prepare as they are to receive.

There's no post-season clean-up problem with suds snow. It washes easily off mirrors and windows, leaving them cleaner than before.

Whichever way you choose to use it, this idea can make your Christmas brighter. Like to try it?



Even Junior gets into the act when suds-snow is used for decorating. Easy to prepare, this "snow" washes quickly off mirrors and leaves them sparkling.

Gift packages are conversation pieces when they're decorated with suds-snow. They have the personal touch that's associated with Christmas giving.

. . . and another to use the whole year thru

Here's an idea that "tees off" on the problem of tracking down employees. It's a real timesaver for PBX operators.

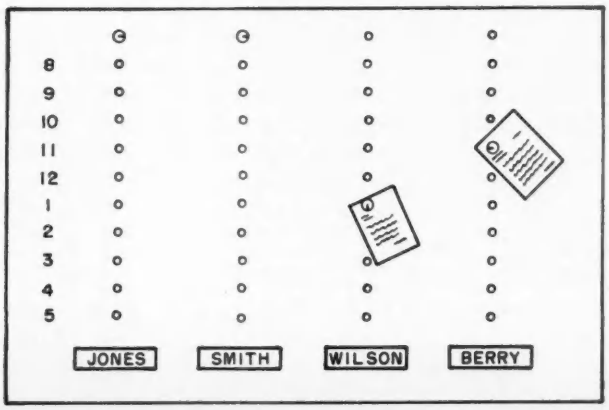
All that's needed to get this idea into operation is a piece of inexpensive Masonite pegboard and a few golf tees. First, the pegboard is mounted on a wall above the switchboard. Then the name of each employee is typed on a strip of paper and pasted across the bottom of the pegboard.

The tees will be used to indicate whether or not the worker is in his office. When the worker is at his desk, the tee above his name will be in the top row. If he leaves, he tells the PBX operator the time he expects to return, and she moves his tee down to the hole opposite that hour. Normal working hours will be listed vertically at left side of the pegboard.

A black line, easily made on the head of the tee with a ballpoint pen or grease pencil, will serve as a minute hand. For example, if a worker is to return at 1:30 p.m., the tee above his name will be moved to the hole directly across from 1 o'clock. The black line on the tee will point straight down just like the minute hand of a clock at the half hour.

A note may be placed on the tee, indicating where the employee has gone. If a worker has to be located in a hurry, this simple device saves a lot of time and trouble — and expensive trunk holding time.

With a glance, the PBX operator can tell whether or not an employee is at his normal place of work. Tees in top row indicate that Jones and Smith are in their offices. Wilson is out and will return at 1:30. Berry will be back at 11:45. Each has left word where he can be reached, and this is noted and attached to the tees.



With gum and goo

Solving a sticky problem by making it stickier

It's gummy and gooey and sticky to you, but toroidal coils don't seem to mind.

A toroidal coil is simply a coil wound on a closed ring core. It has a vital circuit function in keeping carrier, microwave and toll ticketing on the job. At first these coils had difficulty staying out of trouble; moisture, shock and a variety of other hazards were interfering with reliability. Safeguards were necessary to make the coil completelv dependable. *What's the solution?*

It was easy to see the difficulty . . . but the best solution was harder to find than roast beef at a vegetarians' convention. Then Stromberg-Carlson material engineers homed in on the problem.

Sticking to the job. When engineers were faced with the problem of protecting toroidal coils, they stuck right with it. Their answer made the coil sticky, but safe.

The generally accepted method at this time was to dip-coat an unsupported coil. This gave some protection, but not nearly enough. A later process added a plastic mounting board for extra support. The mounting served to locate lead wires and make the coils adaptable to printed circuit cards. But the coil mortality rate was still high.

Plastic housing used

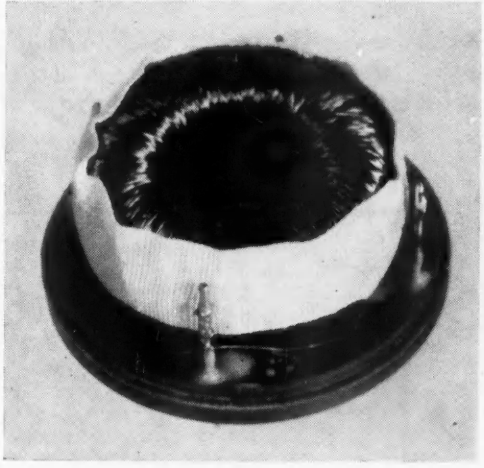
A new approach was tried. This plan called for a plastic housing as the safest place for the coil. That's where the gum and goo figure — they moved in, too, as snugly as poor relations after the funeral. Toroid was safely surrounded.

The housing does far more than hold goo. It's a cleverly constructed case-cover combination that unifies to do its whole job efficiently. Holes for plug-in leads are provided on the cover. Slots to align the leads on the outside and inside are also there. The door to the housing is a hole in the center of the cover. It's open until the encapsulating compound is firmly set. Then it's locked tight. Moisture doesn't have a key.

Resin secures coil

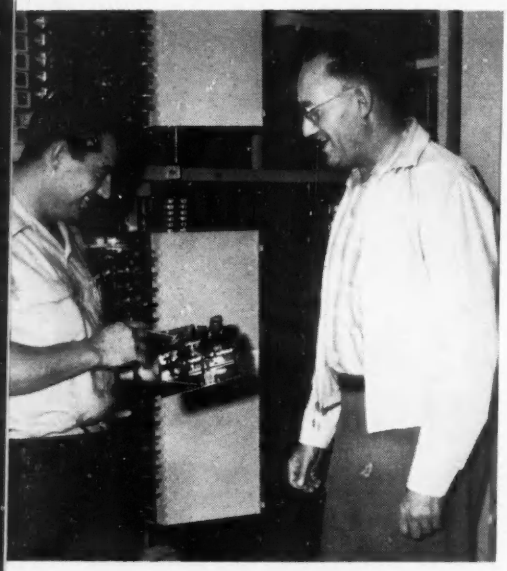
To assemble the housing, the proper number of plug-in leads are placed in the keyed holes on the cover and secured there. The coils are mounted by soldering coil-winding leads to plug-in leads. This sub-assembly is then inverted into the case and potted. Potting is the addition of gummy substance — modified epoxy resin — that holds the coil securely in the case. When the going gets tough, it sticks to the job. Tests made at 130°F with 95% relative humidity couldn't bother it. And the heat-aging treatment caused no breakdown whatsoever.

The toroidal coil seems to be getting along fine now. It's on the job despite shock or moisture, helping carrier, microwave and toll ticketing equipment perform their work dependably. It was a problem for a while — a sticky problem — that Stromberg-Carlson engineers solved in a unique way. They made it even stickier!



It's more reliable. A coil mounted on its molded diallyl phthalate cover is shown with plug-in leads soldered to coil winding leads. The polyurethane-insulated coil-winding wire and cemented plug-in leads are part of the reason this coil can withstand wear, perform more efficiently.

Ready for service. The potting compound was added through center hole after cover assembly was inverted into molded phenolic case. Four plug-in leads can be seen on inverted cover. The three radial ribs act as standoffs against the printed circuit card.



"Number Please!" Manager Harper Saunders, right, and W. J. Thompson, plant manager of Owyhee Telephone, are still fascinated by the mechanical genius that has taken over the operator's job.

Constant growth story in Idaho

Owyhee averages new subscriber a week for nearly thirty years

Idaho's famous potatoes are known all over the country. But in the Homedale, Idaho, region they are only part of the economic picture. Sugar beets, corn, beans, peas and a variety of other crops supply an important segment of the area's income.

While the crops vary widely, telephone service around Homedale has been operating on one constant principle since 1919 — "Give them good service."

The Owyhee Telephone Co. recently took another step in carrying out that principle. Its three exchanges — at Homedale, Marsing and Wilbur, Idaho — have been cut over to XY Dial.

Manager Harper Saunders believes that a "best available" policy will pay off for his company. Since he took over in 1930, the number of stations served has jumped from 230 to 2060 for an average of better than one new subscriber every week.

Telephone management is nothing new to the Saunders family. Mr. Saunders' father originally purchased the Owyhee Telephone Co. more than 40 years ago and ran it until 1930.

The company employs 15 and serves part of Owyhee and Canyon Counties in southwest Idaho. It is the second largest of Independent Telephone companies having all their exchanges in the state of Idaho.

Seasons change. Winter has set in at Homedale, but this modern structure is built for any weather. It houses dial equipment and commercial offices of Owyee Tel. Co.

Checking out bills. Hester Tuttle, left, office manager, and Peggy Larzlier, clerk, enjoy welcoming subscribers at the desk of the Homedale office.

At Canton Texas: Service again makes sales

Butcher, baker, candlestick maker — no matter what the business there's one idea that's always well to keep in mind. This is especially true in the telephone industry. The idea? Just this — "To sell is to serve."

The Southwestern States Telephone Co. of Brownwood, Texas, recently proved once again how right this is. Company personnel conducted a Telephone Week to inform subscribers about various dial services available when the Canton exchange is cut over. The public responded in fine fashion.

A main attraction of the Week was a display in the new Canton business office. One of the display's features was the versatile Stromberg-Carlson 6K-1 telephone system. With this system, subscribers may answer calls on one to five central office, PBX, intercom or private lines. Southwestern States reports that interest was very heartening, and at least one sale was completed on the spot.

Telephone counselors were also busy serving subscribers during the week. They visited homes and offices, helping the subscriber select the type of service that would best fit his individual needs. Numerous upgrades in service were contracted, and many extension telephones sold. A large number of new installations were also booked at this time.

"Like having the staff right in your office." Carolyn Boren of Southwestern States Tel. demonstrates versatility of Stromberg-Carlson 6K-1 unit. This system speeds communication, eases the burden in busy office.

Transmitter

GEORGE B. FORBES, Editor

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THE BACK OF THE BOOK

By JOHN G. REYNOLDS

A Worthwhile Hobby

WE understand the whole world's a classroom to Joe Bitterlin of Pacific Bell's Los Angeles traffic division. He and his wife Amalia recently finished another "semester" . . . a 15,000 mile trip to Central and South America.

Joe told *PTM Magazine*, "I've been working on language and travel for over 30 years. My purpose in traveling is not so much recreation as education. I want to learn as much as I can about the language and culture of people all over the world.

"We've traveled in more than 30 foreign countries. We've studied Europe, Central and South America, Mexico, Cuba, and the Hawaiian Islands. Asia's next."

Joe puts his languages to work at the International Institute, a Community Chest (A.I.D.) activity specializing in helping foreign-born people and their children adjust to the American way of life. He's a member of the board of directors, and is also a delegate to the Welfare Council.

"Many people come to this country from many lands, speaking many languages. At the Institute, we are able to help them with the problems associated with living in this country. It's rewarding and interesting work," he said.

He speaks fluent Spanish and French, finding that "these two languages, plus a halting command of English," enable him to converse with people all over the world. Joe has taught languages at Stanford University and at the University of Southern California. He has lectured before many organizations in this country and abroad, and has given courses in Latin American civilization at U. S. C. and at the National University of Panama.

A man of many talents and interests, Joe has also sailed in two Trans-oceanic yacht races to Honolulu as navigator . . . another subject he teaches!

Amalia teaches French and Spanish at the Marlborough school in Los Angeles, and is the Vice Consul of Panama in Los Angeles.

The Bitterlins are making real contributions to their communities, by helping to make things smoother for newcomers to our country.

"I would encourage everyone to study a language . . . any language. It brings a person closer to the people of the countries who speak that language, and this can only lead to better understanding," Joe concluded.

Protection

LAST month the editor of the "Blue Bell" proved the pen is a mighty weapon against vandalism of telephone booths with his story of a Portland, Oregon, merchant who wrote a note and placed it in the phone booth near his store. The note read:

"If you wreck this phone, it may cost someone his life. It may be your own. For a few paltry dimes, do you think it is worth it? I don't!"

Since the note was posted the phone has not been damaged. Before that it had to be repaired on an average of once a month.

"A Fair Question"

OUR Arkansas correspondent tells us a Little Rock pay-station user recently sent this letter to S. W. Bell's office in Little Rock:

"Today I used your telephone booth at Wright Avenue and Battery Street and missed getting my number, but hit a jack pot! The machine coughed up two dimes when I hung up.

"Now, I'm not a do-gooder, but it ain't my dime, so here it is. Why don't you throw it into the coffee kitty in your precinct instead of doing $40 worth of accounting to account for it?"

"Two tin cans and a string is not exactly what I had in mind for an extension!"

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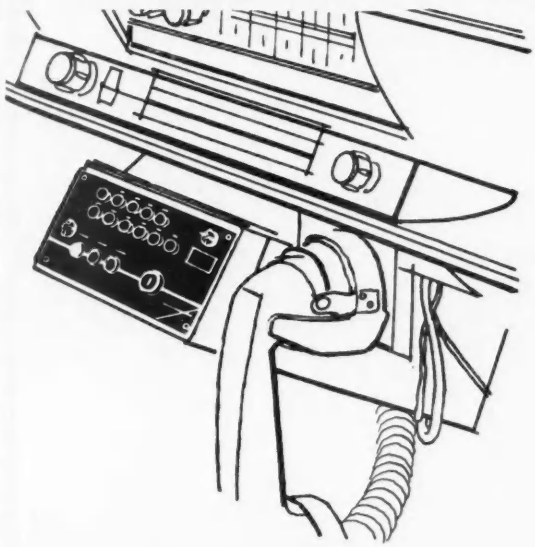

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